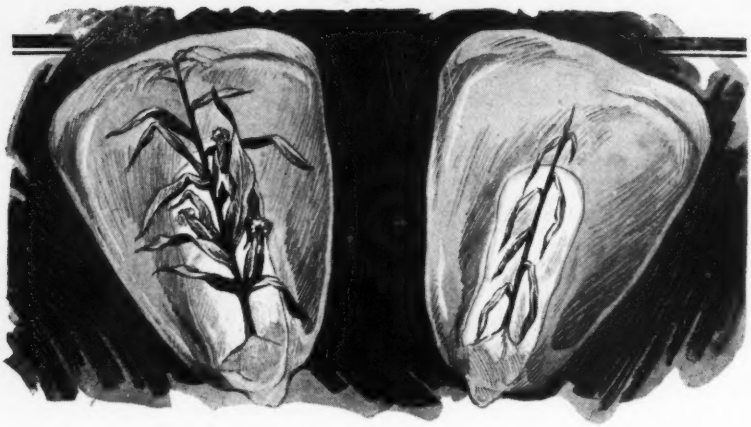
Better Crops

The Pocket Book of Agriculture

May 1924 ...nts.

In this issue—Dr. E. W. Allen—H. C. Brewer—
Albert Hansen—Jeff McDermid—W. A. Ostrander



What is in your seed this year?

YOU have picked the best seed you can buy, of course. It is the right variety, and a germination test shows very high.

But what is actually in the seed?

What is there in the seed that determines whether the yield will be 10 or 90 bushels per acre?

The one important factor that determines the yield is the supply of plant food *in the soil!* In the seed is only a germ of life that will send out roots. If the roots stretch out but to encounter a thin, weak diet the corn suffers and the yield is light.

There is only one way to be sure that lack of enough potash is not holding back crops—*try it one year.* At a very small cost you can try potash; sow a check strip if you wish, or make any other test. But *try* it. See with your own eyes that it increases the yield.

Buy mixed fertilizer and insist on a formula that is high in potash.

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Genuine German

POTASH

USE THE POST CARD

SOMETHING is wrong with agriculture.

I don't think it necessary to debate the point—there are too many facts at hand to prove it.

What you and I and the other readers of BETTER CROPS are interested in is: what can we do to help matters?

In other words, I am trying to formulate in BETTER CROPS a definite, constructive program for agriculture. I want this program to represent not merely my own personal opinions, but the sentiment of thinking agriculturists all over the country.

As one who works for the general advancement of agriculture and who is called upon to advise the farmers of the country, I feel that you have unusual opportunities to put your finger on the weak spots in our agricultural structure and to suggest constructive remedies.

If it were possible, I would like to sit down and talk it over with you personally. Unfortunately I can't, so I have to ask you to let me know your ideas on the subject.

I am enclosing a postal card with this issue which provides you with an opportunity to express briefly your suggestions for a constructive program. If you want to write a letter, so much the better.

Just one word of advice—leave out all political and religious issues. It seems to me there are other fields—economic and social—where our energies can be more usefully expended.

What does agriculture need? Yes, I know it's a big question but I hope you'll take a crack at it. I want to publish some of the best answers in our next issue, so get out the old pen or pencil and dash off some of your pet ideas.

Let's go!

Yours to a cinder,

Jeff McDermid

Learn the truth about Fertilizer

Commercial fertilizer is not magic. It is no substitute for work, or for farming brains. It will not make a successful farmer out of a shiftless, ignorant failure. Fertilizer varies in quality like corn or tobacco or cotton, and some brands are worth more than others. Good fertilizers, like Royster's reliable old mixtures, are a godsend to good farmers who learn how to best use them to make money

Nearly forty years experience enters into the making of the Royster mixtures, and hundreds of thousands of the country's best farmers pin their faith to this famous old brand.

For advice about the use of fertilizer, write to Farm Service Department.

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Field Tested Fertilizers

Better Crops

The Pocket Book of Agriculture

VOLUME II NUMBER THREE

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¶ *Out to the Great Open Spaces where Pigs is Pigs. These hogs from one of the largest hog farms in the Northwest are being turned out to pasture for the summer.*

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On the Art of GIVING ADVICE

By Jeff McDermid

THE antagonism of the receiver for the giver of advice is a theme around which brilliant intellects for years have revolved in a vain endeavor to discover the genuine source of the animus.

I use "revolve" here advisedly, for "revolve" means to go 'round and 'round without getting any place; and those who weave such cleverly cynical quips as *"men give away nothing so liberally as their advice"* have surely not helped us a bit in understanding the other fellow's antagonism to the aforementioned advice. We are where we started and have but a painful dizziness to remind us that we have been revolving with them around the theme.

There are two kinds of knowledge; that which is stored away in your own brain, and that which you can lay your hands on when you want it. And of the two the first is to the latter as a single grain of wheat to the wheat of the world—there never will be a monoply of knowledge. What you know, you know, but what you do not know is no handicap if you know the gink who knows what you *don't* know!

The world is as full of knowledge as a week old fly-paper in a restau-

rant window is full of flies. The trouble is: life is short, and the period in which our brains have sufficient suction to blot up the facts that are spilled before us is still shorter.

THE result is that we become specialists. Knowing that none of us will have time while living to absorb the whole loaf of knowledge, we each corral a crumb according to our tastes and inherent abilities —you to your crumb and I to mine. You learn to shoe horses and I master the trick of grinding valves. When the valves of the "quiver" need fixing you come to me; and when ol' Nell casts a left hind shoe I bring her in to your shoe-foundry. And so, having become specialists, we are each countless hundreds of times placed in positions where we need advice.

You can certainly tack a nasty shoe on ol' Nell but, when she emits throaty palpitations, I put in a hurry call for Doc Neavers, the veterinary; and his advice as to whether it's the heaves or hiccoughs means a lot to me—and incidentally to ol' Nell—for he is a hoss specialist. His particular crumb is horseflesh, while yours is horse shoes and mine is hearse-valves. Doc's time is valuable and his fees are high, but ol' Nell is worth a lot of money to me, and I am helpless. All day long, when I am not working upon my own little crumb of a specialty, I am at the mercy of outside advisors who must come in and show me how the thing should be done, or do it.

And so we come to the subject of "giviing advice."

The trouble with this phrase lies not in the word "advice." No. The fault lies in the verb "give." Change this to read "sell" and the trouble is over. That which is given you is worth just what it cost—we value things at their price, and treat them accordingly.

Advice is usually given by a buttinsky-plus whose counsel is anathema. Advice is sold by wise men who part with it only for a good reason,—generally mazuma, coin, dollendii.

But gratuitous advice is not sour in itself—what pains us is the fact that such advice is offered wholesale and marked "no charge," when no order was ever issued for the stuff! The ball that blacks the eye is the ball that is thrown without request—the hands are not prepared to catch it; but if I say "throw the ball" and you do so, I catch it, save my eye, and am pleased.

To shove advice at a farmer just because we think he ought to have it is to invite his resentment and enmity. To make the farmer want advice and seek it from us is to open the door to lasting friendship and real service.

"Admitted," you cry, "but how can we make the farmer want advice?" Of course, there isn't any pat answer to that question, but from my observation I have found that the most successful agricultural advisors are those who in a modest and unpretending way teach by example as much as by advice.

Good advice is priceless, and when linked with good example is worth just twice this much. But good advice and bad example smack of "do as I say and not as I do," and are not only unheeded but resented.

THOSE of us whose business it is to scatter advice should study our profession. We should master the psychology of salesmanship, read Le Bon, learn the gentle business of mob-mind, and the rest is easy. The antagonism toward free advice is often not antagonism toward the advice itself, but to the setting in which it is offered. The resentment is against the patronizing air of the vendor. Let the advisor learn to *sell* his ideas, even though his pay comes from remote quarters and not from the man to whom the advice is given. (*turn to page 53*)

¶ "You've had a lot of articles about County Agents," said the Missus the other day, "why don't you give some credit to their wives? They do a lot of good work, too." ¶ "Right as usual" I chirped, so I selected this fine appreciation of the silent (sometimes) and indispensible (always) partner. Shall I print some more?

How My Wife Helps *in* My Work

By *a County Agent*

OF course this will have to be quite a personal interest story but, after about eleven years of time spent working for the public, and all that time having a wife who was interested not only in *my* undertakings but interested in the *work* because she wanted it to be worthwhile, I feel that perhaps what I may say will be of some interest, especially to some of the young fellows who have not yet had the courage or the nerve to assume the responsibilities of providing for two.

Getting back to the beginning I believe there are a lot of young fellows today who wait too long to assume these responsibilities, thinking they must have several thousand dollars laid up in the bank and a modern house with all conveniences at least partly paid for before joining hands with a life partner.

In my own case, for the encouragement of some of these folks, I will say that we had just two hundred dollars when we were married and we joined hands and struck out together. We have had a good many ups and downs but really they have been mostly "ups" for these years have been spent in trying to do something for our fellow farmers who had not had the opportunities that we have had in the way of experience, education, etc. In fact, after about eight years of actual county agent work, I do not see how a County Agent can do his best work unless he has a wife who is at least interested in what he is doing. My wife was a "farm raised" girl and consequently has the farmers' viewpoint so that when talking to a farm woman over the telephone or at community meetings or elsewhere she knows just how that woman feels and the problems she is facing for solution.

NOW to come right down to the subject of just how she helps in the work I will suggest a few ways. Of course the answering of the telephone at the residence late in the evening and early in the morning is a part of her work, and when she has to answer calls over the phone in the day time when her husband is out in the county some place she is often called upon to give what information she knows to be correct, having heard it stated over and over. In the spring of the year when the young chickens are being hatched and the crops are being put out there are more phone calls than at any other time. She is very often able to give some simple directions to the person who is having trouble with chickens or to some farmer who calls up to know where he may obtain some good (*turn to page 59*)

HIGH YIELDS *MAKE* LOW COSTS

PART ONE

By H. C. Brewer
Soil Improvement Committee
National Fertilizer Association

¶ This article and the accompanying illustrations have been courteously furnished by the Soil Improvement Committee for exclusive publication in BETTER CROPS. *¶ There is a big punch in this message that I hope will get across to every one of our readers.*

EXPERIENCE has shown that the most successful growers are those who produce at the lowest cost per unit. Their yields are usually above the average, often far above it. Proof of that fact is to be found in the records kept by thousands of farmers. Low yields and low costs are seldom found together in the same field.

Professor J. I. Falconer, Agricultural Economist, Ohio State University, makes this statement:—

> "Inefficiency in production is no cure for low prices. Experience and research have shown that farmers with high yields make greater profits than their neighbors with low yields. On high-priced land high yields are more economical to produce than low yields. If a reduction in output of a particular crop seems desirable, it would be better to reduce the acreage or, for individual farmers to abandon the crop entirely than to reduce the yields."

The progress in efficiency made by the farmers of Ohio during the last 10 years is sufficient proof of the accuracy of such a statement. Take, for example, the records of two counties in the State. During the period, 1900 to 1910, the grain growers in one of these counties averaged 64 bushels per grower and in the other 154 bushels. During the next ten years these growers raised their output to 249 and 264 bushels per grower, respectively.

THE significance of such progress in personal efficiency is greatest when labor is costly or when the prices of farm products are relatively low, as during the course of the 1923-24 wheat market. During that time, when most wheat farmers claimed not to have made their cost of production, many Ohio farmers, according to the college authorities, made more money on wheat than

This is an Interesting Story

John Shutt and his father, of Garrett, Indiana, had a contest to see who could grow the most, the best, and the cheapest potatoes. The father's crop is shown at the left, the son's at the right. Mr. Shutt used ordinary seed, 17 loads of manure,

no fertilizer; his yield was 75 bushels per acre and cost about $1.13 to produce. John used certified seed, the same amount of manure, and 475 pounds of a 4-8-6 fertilizer. His yield was 227.6 bushels and cost about 36 cents a bushel.

in the preceding year. Records kept by 20 representative Greene County farmers were made public and showed that the high rate of yield reduced the cost of production to 83c a bushel, 11c below the average selling price from August to October. Lower yields on the same farms in 1922 were responsible for production costs averaging 99c a bushel, compared to an average selling price of one dollar.

A Chester County, Pennsylvania, survey made in 1911 shows that when the crop yields were 84 per cent or less of the average, the labor income was only 49 per cent, of the average; but when the crop yields were from 115 to 139 per cent of the average the labor income rose to 153 per cent of the average.

IN Sussex County, New Jersey, the results indicated that the farmers with crop yields 30 per cent or more below the average made labor incomes averaging only $268, while those with yields ranging from 16 to 30 per cent above average made incomes of $687.

The results of a five-year survey in Washington County, Ohio, made under the direction of H. W. Hawthorne of the Bureau of Agricultural Economics, U. S. D. A., have been summarized by Mr. Hawthorne in so far as crop yields are concerned, as follows:—

> "The group of farms that had both poor crops and poor stock had an average labor income of $4 per year. The group with no better stock but with good crops had an average labor income of $134, while the group with no better crops but with good stock had an average labor income of $216.
>
> "The group of farms with medium crop yields and medium stock had an average labor income of $108. The group with no better stock but with good crop yields had an average labor income of $212, while the group with no better crops but with good stock had an average labor income of $302.

"The farms with both good crops, and good stock had the highest average labor income—$397."

In a Minnesota survey the group of farms which averaged 31 per cent below the average in crop yields made labor incomes averaging only $37 while those of the highest yield group with yields 33 per cent above average made labor incomes of $504. Thus with yields not quite doubled the net earnings of the most efficient farmers were almost 14 times as large as those whose yields were lowest.

PROFESSOR E. L. Nixon, Pennsylvania State College, discussing the work of the "400-Bushel Potato" Club of that State, in 1923, says, "The winners in the '400-Bushel Potato' Club grew the cheapest potatoes that were grown in Pennsylvania last year and have demonstrated conclusively that the higher the yield per acre, the lower the cost per bushel will be."

Jacob S. Wile, who produced the largest yield of potatoes in the State last year, 532.4 bushels on one acre, averaged 445.8 bushels on a piece, 5.9 acres in size. His total cost was $717.50,—$121.60 per acre or 27.2 cents a bushel. On his best acre, the cost dropped to 22.8 cents a bushel, one of the lowest figures on record. It is of interest to note in passing that Mr. Wile used Michigan russets for seed on a good clover sod, well manured the previous fall. He applied 1,200 pounds of fertilizer per acre, plowed and disced thoroughly, cultivated three times before, and four times after the crop was up. He sprayed nine times.

Considerable authoritative information is available, much of which is drawn from actual farm experience, showing the unfailing effect of high rates of yield upon unit production costs. Apparently it may safely be said that within certain limits, not even approached in the general run of our present system of farming, the higher the rate of production on each acre, the lower will be the cost of producing each unit of the product. Any reasonable expenditures, over and above the amount required for average production,—for more careful preparation, better seed, more adequate fertilization, more thorough cultivation, spraying, etc., —will be returned in the profits from the extra units of product.

CORN

A number of Illinois farmers have been keeping careful records of their corn growing costs, under the supervision of the State College of Agriculture. These records show that when the yield was 30 bushels an acre, corn had to bring 70c to pay a fair interest on the investment, taxes, depreciation; and give the grower, ordinary farm wages. That is, it cost $21 an acre to grow a 30-bushel crop. The records show further that a 40-bushel crop cost $21.70 and a 50-bushel crop $22.40. The farmers in the 40-bushel group paid all expenses and had a nine bushel profit that the 30-bushel group did not have. The 50-bushel group paid expenses and had an 18-bushel profit.

THE corn-growing contests that have been carried on in several States during recent years offer convincing evidences. Professor R. S. Thomas, Chairman of the Indiana, "Five-Acre Contest" Committee, remarks, "Increased yields and more economical production were demonstrated in several counties from applications of fertilizers, use of legumes in the rotations, field selection, and testing of seed corn, rate of planting, etc."

The U. S. Department of Agriculture has given out figures which show clearly why it is that low rates of yield (*turn to page 51*)

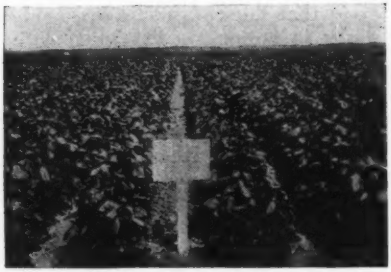
From Low Cost to High Cost in Hay

The Cornell (N. Y.) Station recently made tests to determine the effect of various fertilizer treatments on hay. These photographs shows the results.

The stack on the left had no fertilizer and represents a rate of yield that is considerably more expensive than the one on the right.

Seven Years Results on Soybeans

It costs nearly the same to make a high or low rate of yield, even with soybeans. This test has been running over seven years at the Delaware Experiment Station. Without fertilizer, the beans at the left have averaged 14.6 bushels per acre. Those at the right with 325 pounds of a potash-phosphate fertilizer have averaged 24.4 bushels. That is at least an eight or nine bushel profit.

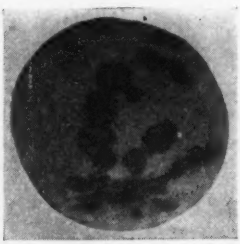


¶Here is good proof that an article can be sound science and good reading at the same time. You said a mouthful, Brother Schneiderhan, when you said—

"Let Us Spray"

By F. J. Schneiderhan
Virginia Experiment Station

THIS is a plant pathologist who rises to remark that the phonetics of "Let us Pray" and "Let us Spray" are nearly identical but for the orchardist, the latter has much more of a kick to it. It represents faith with the good works. You know, a man may have unbounded faith in his dollar watch, but eventually he will discover that faith without the good works is nothing. The religious perusal of the old fashioned almanac with an occasional squint at the shape, color and tilt of the moon used to be the farmers' great indoor sport of the spring season. This procedure was hot stuff for apple growers in King Tut's day or in the good old days when Moses wore knee pants, but today, the experiment station spray calendar has taken its place. There is no mysticism or voodooism connected with proper control of fungous and insect pests of the apple. It is easy, that's why we are going to tell how it is done. All that is necessary is a common sense insight into the habits and development of these pests, after which the necessary sprays can be applied that will knock them for a row of marble mausoleums. Do not forget, Mr. Apple Grower, that there is no race suicide in the fungous and insect pest ranks and that unless you control them they will keep you just a few hops and skip ahead of the sheriff. Therefore, let us spray.



Apple Scab, a fungous disease, which has caused 30% of all culls in certain wet seasons in Virginia.

Have you ever met the apple grower who claims he can spray seventy-five acres of bearing orchard with one 200-gallon spray rig and properly control scab and codling moth in a scabby and wormy orchard? We meet him frequently in our work but remember, "It can't be done." With such a ratio of equipment to acreage he might as well try to shear wool from a hydraulic ram as to try to produce a high percentage of clean apples in a section seriously bothered by such

Probably the largest pile of apples ever collected. One million pounds of cull apples at National Food Products plant, Winchester, Va. Approximately 65% of the causes of these culls are preventable through good spraying. The author of this article is shown at the left.

pests as scab, cloud, bitter rot, black rot, codling moth, curculio, aphis and scale. Forty acres for one good 200-gallon rig should be the maximum.

The Cumberland Valley, extending from Gettysburg, Pa. to Roanoke, Va., possesses such advantages of climate, soil and proximity to excellent markets that it promises to become one of the greatest apple producing sections on the face of the globe. But, and this but should be written BUT, the average apple grower in this section does not produce a sufficiently high percentage of apples that are fit to be barreled. He raises too many culls. Unless he raises a higher percentage of barreled apples he is never going to realize his full measure of profits, because raising cull apples that sell for forty cents per hundred-weight has never been and never will be profitable. It costs just a little bit more to produce a barrel of good apples than a barrel of culls and the returns are six times as great.

The best data available shows that the average grower in this and in certain other section of the United States fails to put more than sixty per cent of his total tree crop into barrels. With proper management he ought to barrel 80 per cent of his crop. The main reasons for this failure are: insufficient spraying equipment, improper and poorly timed spraying, and an insufficient number of spray applications.

THERE are probably no two orchards exactly alike. The apple grower must become the investigator of his own orchard and know such facts as susceptibility of varieties to particular pests, the importance of certain pests in his orchard, and the correct time to apply sprays that will effectively control these pests. The State Experiment Stations of Pennsylvania, Maryland, West Virginia, and Virginia have studied the apple pest situation thoroughly and consequently have prepared spray calendars recommending the proper spray materials, correct proportions, and through their spray services, they inform the growers of the proper time to apply these sprays. The grower who follows these spray recommendations cannot go wrong if he carries (*turn to page 57*)

The Experiment Stations and Agricultural Extension Work

By Dr. E. W. Allen

Chief, Office of Experiment Stations,
U. S. Department of Agriculture

YOU ask what the experiment stations are doing to help county agent work. I should like, if I may, to broaden your question to include what the extension people can do for those engaged in investigation—what the two groups can do for each other, for that may bring out more clearly the true nature of their relationship. That relationship is by no means a one-sided one, but ought in the largest sense to be reciprocal.

IT will be recalled that the slogan on which the Smith-Lever Act was passed was that of putting to work the information we already had. It was contended that in very many respects practical farming was far behind the present stage of information as developed by research and experimentation, and that to put this practical information into more general operation an intimate and continuous contact with the men and women, the boys and girls, of the farm was needed. The idea was so convincing that the people consented to tax themselves for it all along the line, from the general Government down through the State and county units, to the individual farmer in many cases.

And so this great system of agricultural extension with its county agents all over the land developed ostensibly upon the basis supplied by years of research. The war gave it an unforeseen impetus by the unusual demands upon American agriculture; and while it grew, as scarcely an agricultural movement had ever grown before, the experiment stations practically stood still. They did not cease their efforts but their appropriations failed to show any increase, even in the face of mounting costs. Hence few of them were able to maintain themselves on their former basis, and the system as a whole suffered a severe setback from which it is only recently recovering.

But this interval gave extension a chance to catch up, to put into wider effect much of the accumulated information; and as this went on new questions arose, as was to be expected, because a new army of workers in every-day contact with the individual farmer were bringing their skilled observation to bear on his problems and the means of

¶It is certainly a pleasure to welcome Dr. Allen to our pages. His subject is of great importance and his discussion of it most illuminating. See if you don't agree with me that this is one of the best articles we've run in BETTER CROPS.

Jeff

helping him. Some of these questions could not be answered, or only partially so. There was thus brought forcefully home the large reliance of extension work on the activities of the experiment stations, the necessity of maintaining the supply of information, stocking up before it is exhausted, and to an extent keeping in advance of the immediate demand.

Obviously no one can teach or prescribe or give expert advice until he has sound information. If he undertakes to do so on his own notions we call him a quack. Everybody knows there has been quackery in agriculture in the past as well as honest misinterpretation of experience, but the present effort to get away from such sources of error is one of the striking and recent developments in this ancient industry.

So, in the process of teaching and improvement, research logically comes first. In that sense it is fundamental, not necessarily because in the long run it is more important, but because the other steps are based upon it. It will be recalled that the experiment stations were at work twenty-five years before extension teaching was organized on a broad scale, and the efforts of the stations to carry their work out to the people was the beginning of the extension movement. The taking over of this line of activity by the new extension agency was a natural division of labor.

THE prime object and the justification of research at public expense is the use to which it may be put, either in the practical walks of life, for the enjoyment and well-being of the people, or in providing an insight which will help in developing deeper problems. The experiment station worker, therefore, bears a responsibility to the extension worker, through whom his results so largely reach fruition by being put to work, and beyond this he relies upon him in a variety of ways.

The extension worker is a middleman in science, if we may use a term in some disfavor at the present time. He takes the product of others and distributes it to those who need it, combining his practical judgment and his knowledge of how best to make it effective. Like the investigator, he is dealing with scientific matters, and hence needs to have an understanding of science and an appreciation of what a scientific

fact is. It will show him how dangerous half-truths may be.

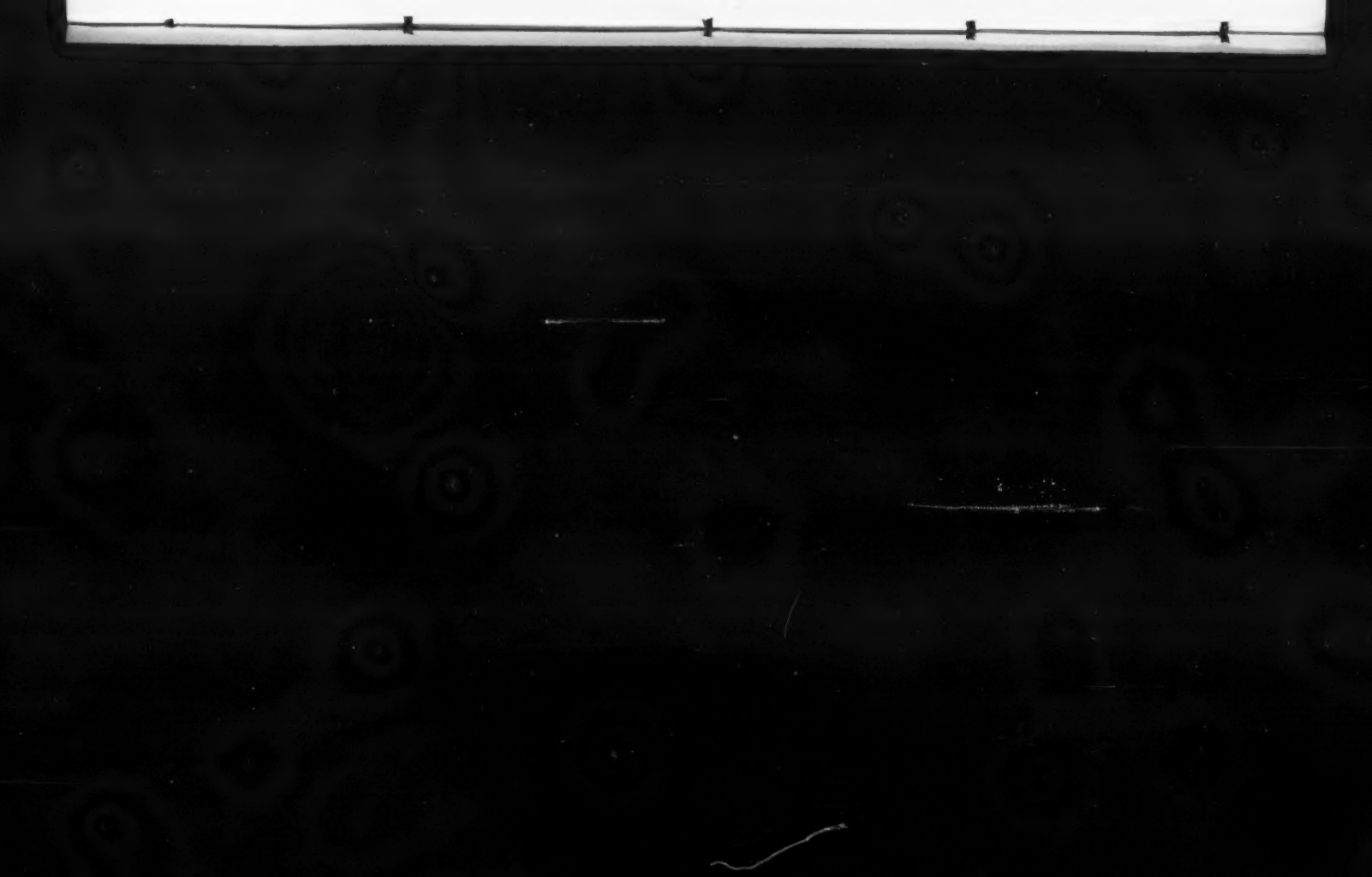
THE county agent is far from being a routine worker. His job is very different from that of the teacher of arithmetic or geopraphy of history. The school teacher deals with things that are fixed and are just as true in Maine as in California. The extension man, on the other hand, is dealing all the time with variables—human, biological, physical, and economic. Frequently he will have to adapt the suggestions which come to him to local conditions or systems in vogue. And to give him skill and judgment in making these local applications or accounting for differences in results, the investigator ought to work out for him the conditions of success, the limitations surrounding the fact, the influences which may modify it in practice. For we recognize that most knowledge is more or less relative in its approach to the exact truth; little of that relating to agriculture is absolute and complete. But we demand that the facts and principles worked out for the farmers be as nearly accurate as it is feasible to make them at the present stage, and we want them to be reduced to a practical basis before their use is advised.

On the other hand, the investigator ought to know of the difficulties that may be experienced in putting his results and recommendations into practice. He ought, through the organization of the two agencies, to be in sufficiently close contact with these teachers in the field so that he may have constantly the advantage of their experience and their view, and may receive from them suggestions of special topics upon which information is needed. To a considerable extent the county agent may be the eyes and ears of the station worker, for he is close to the practical situation on a far larger scale than the investigator can be. And beyond this he may make better understood the value of the station work and the reasons why its methods sometimes seem slow.

Extension work won its way with the general public much faster than investigation. Probably it always will, because it is closer to that public and the immediate value of what it is doing is demonstrated in a thousand ways. Practically everything it does is of that immediately helpful nature. On the other hand, relatively little of the day by day work of the investigator ever reaches the public. This may be a surprising confession, but it is due to the process by which new facts are worked out, or applications confirmed.

The steps by which the investigator proceeds may lead to a great deal of work which never reaches the public and which, if it did leak out, would be likely to be misunderstood and unappreciated. It is only the final results in their practical aspects which reach the general public, provided the work leads to something of practical value, and in the meantime the worker may find little encouragement outside of his institution and his coworkers. No one was interested in radio, except possibly as a big curiosity, while it was in the stage of physical study of sound waves, vibrations, and electrical impulses. It was only when these studies had enabled something to be produced which was so simple it became applicable to every day life that real interest was aroused.

BY understanding the investigator and his method, by recognizing him as indispensable to his success, the extension man can help him to be understood, and the need for his support to be appreciated. If a farmer says that the experiment station is not doing anything for him, that the county agent is meeting all his needs, it will not hurt the (*turn to page 55*)



(Dr. E. W. Allen, Chief, Office of Experiment Stations, U. S. Department of Agriculture, Washington, D. C.

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© U.S.D.A.

¶A little missionary work! County Agent R. W. Graeber of Iredell County, North Carolina, is telling this farmer about the use of Lespezda for soil improvement and pasturage. Looks like he was putting it across.

¶This is not shaving but unhairing. One of the laboratories of the Department of Agriculture is working hard on the problems connected with tanning and treating leather. Their work ranges from the preparation of the raw hides to the use of dyes and different kinds of shoe polish.

© F. Dickie

¶Wild deer feed from the hand of this remarkable man who maintains a reservation for them on Hardy Island, B. C.

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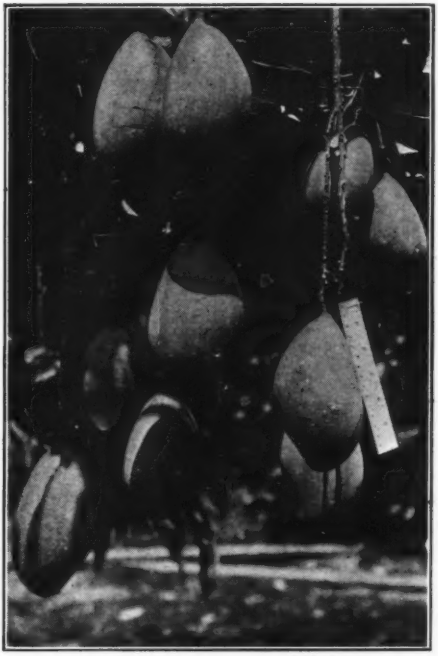
¶In the year and a half she has been a member of the girls club directed by the county agent, Esther Rolfs of Lawton, Woodbury County, Iowa, has refinished the furniture in her room, made curtains, bed spreads, hat box, rugs and other furnishings for her own room as well as a number of articles for other parts of the home at very little expense. She has recently organized a girls' canning club in a nearby town and has trained a team of club girls to demonstrate improved methods of canning at their State Fair.



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¶You might think these were punching bags in an outdoor sporting goods store but in reality they are Sandersha mangoes introduced by the Department of Agriculture from Bangalore, India, and now established in Florida.

¶An agricultural leader of the Middle West, George I. Christie, Director of the Agricultural Experiment Station and the Agricultural Extension Department of Purdue University, Lafayette, Indiana. He was chosen in 1906 to direct the first extension work of the University. His success is evidenced by the fact that this department now numbers 250 members and is the biggest force for improvement in Indiana agriculture. ¶In 1920 he was appointed director of the Agricultural Experiment Station, combining the important research and extension activities in Indiana.

He Found *the* Road *to* PROFIT

By W. A. Ostrander

Purdue University Agricultural Experiment Station

¶This man took the guess out of corn raising. His example is worth following.

NO one horse can work any farm. Neither can manure, legumes, limestone nor fertilizer alone produce bumper crops year after year. Fertilizers are one of the horses in a profitable team for intensive or extensive farming on any acreage. Here is the history of one man's efforts in Porter County, Indiana.

WHEN Mr. Warren purchased this land it was considered of poor quality. However, it was black sandy loam. It needed drainage, and it was sour and needed limestone. The first year, his corn yielded 34 bushels per acre. This was the best he could do.

The next year, after liming, draining and manuring his ground, he was able to get up to 55 bushels per acre on five acres. In 1918, by applying five tons of manure to the acre and nearly 300 pounds of a 1-12-1, he raised his yield to 76.6 bushels per acre on his five acres. He had plowed under a fair clover sod. The next year he plowed under an alfalfa sod that had been down for several years, added eight loads of manure and 220 pounds of a 1-12-2 fertilizer per acre, and planted his corn a little thicker, and made 85.5 bushels. This was a distinct advancement and showed the value of more potash in his fertilizer, and the alfalfa sod.

Because a hundred bushel yield was his next goal, he made up his mind that if there was any possible way to make the ground yield it, and still leave a profit, he was going to do it. He was unfortunate, however, in not being able to get just the fertilizer he wanted, so he plowed up a 12-acre field of alfalfa that was running out, applied eight loads of manure and 400 pounds of a ½-11-5 fertilizer to the acre, putting the fertilizer on broadcast with a wheat drill. This year he changed his corn type, getting one that was bred a little better, free from barren stalks and disease, and planted it a little thicker because he had the plant food to carry it, and the result was that he raised 127.2 bushels per acre. This certainly goes to show that a combination of legumes, manure, and fertilizer applied in the right manner, with the right kind of corn, will produce big yields. It showed him clearly that potash was an element that he needed, and gave him big returns on the money invested. In spite of this steady climb due to the application of good farm practices and the use of commercial fertilizer, his neighbor right across the fence would not change, and in checking his yield found it was 29 bushels per acre. Again a wire fence made a difference of 98 bushels of corn per acre.

In 1921, on the same field, using eight loads of manure to the acre, but increasing his fertilizer application to 400 pounds of an 0-10-10 applied broadcast with a wheat drill and then drilling 100 pounds of a 4-10-0 in the row with the same variety of corn at the same thickness, he produced 114.5 bushels per acre. This was a very dry year and the stalks were not half as high, but it showed that with high plant food content in the soil high yields could be produced. This was a thirty-acre field.

Last year, in 1922, with no rain from the time the corn was about a foot high until late August, he produced 94 bushels of corn to the acre, using eight loads of manure on an alfalfa sod with 600 pounds of an 0-12-14 drilled broadcast, and applying eighty pounds of sodium nitrate per acre when the corn was between six and eight inches high, showing consistently that even though his neighbors produced practically no corn because of the hot dry weather, he still could keep right around the hundred bushel mark. By repeating practically the same performance this year, he raised 107.7 bushels of five acres.

HE has found the combination of fertilizer best suited for his ground for high corn yields, and even though climatic conditions are adverse, he is taking the guess out of corn raising for profitable yields. Because of high plant food content and the right kind in his soil, he can produce high yields. These are official measured and weighed yields, and go to show what a man can do who consistently studies his problem, changes his method of applying commercial plant-food to meet the needs of his plant and his soil and forms the proper combination of good farm practices that are always sure to go a long way toward making agriculture a paying business.

THIS demonstration, extending over seven years, is one of the best recommendations to farmers of Indiana that have similar soil as to what to do to make corn growing profitable. It has been proven that it takes a well drained soil that will grow a legume, the application of manure to help hold moisture and supply a good physical condition, and a good supply of plant-food which is very important to carry the thick stand of corn to a firm, ripened condition of high marketable corn that is always the final test of a profitable crop. Other men in Indiana are going to do likewise.

Forest officers of the Forest Service, U. S. Department of Agriculture going with their tools to fight a fire in one of the National forests.

How I Developed CLUBWORK

By Mark S. Womack
County Agent,
Coffee County, Tenn.

THE appropriation for the work of County Agricultural Agent was made in Coffee County, Tenn. at the July term of the County Court 1922. It was Sept. 1st, however before the work was taken up. Among the first attempts to get something started was club work. It appears that this is the most practical way in which to reach a satisfactory number of people, and make known to them the plans by which efforts will be made to serve them.

I visited as many of the schools as I possibly could during the time I had before the roads were impassable. At the schools, I endeavored to explain to the boys and the girls, and the teachers as well the importance of each one taking an active part in the Agricultural Club Program, and that each boy and girl would be given an opportunity to earn, and learn.

Along with this I was trying to teach the people, where they lived, something about the crops that were being produced on their farms. When I had finished a visit campaign, I found there were 258 boys and girls who desired to follow the course of instruction offered through the Office of the County Agent.

To keep up interest among this large number of members required some real work. It was realized that something of a practical nature was necessary in order to make this a live issue in our County and to acquire a result that would be pleasing. The following plan was at once put into effect. Each boy and girl was given (*turn to page 43*)

Jeffisms

The hand of help is better than the voice of advice.

Courtesy is the ribbon on the box of duty.

Lose yourself in your work and the world will find you.

A tenant rushes in where farmers fear to tread.

Lost — While talking and teaching, a chance to listen and learn.

There are two sides to every question: your side, his side, and the right side.

The most wonderful feeling in the world comes from the knowledge that someone needs you.

Cut the advice; set the example.

If you can walk, talk, think and read you have a chance.

Jeff

Finding Out *with* Squashes

By H. Young

The story of a Michigan grower who learned a valuable lesson.

WHAT one farmer has done another can do, providing he knows how. This "knowing how" is really the whole secret of success on the farm. The man who does not know how to farm will never get rich in the country. Nor, for the matter of that, will every man who *does* know how, but he will come a great deal nearer to it through the application of practical farm knowledge. Life is altogether too short to attempt to learn everything by personal experience. It is much easier, and far more profitable, to benefit by the experience of others. What one farmer has discovered can be passed on with advantage to the great mass of other farmers who have similar problems to meet. Of course, the same methods will not work out in the same way under all conditions, but the fundamental principles involved are of universal importance. It simply becomes a question of common-sense adaptability, which each individual can work out for himself. Nowhere is this more clearly demonstrated than in the growing of market garden crops.

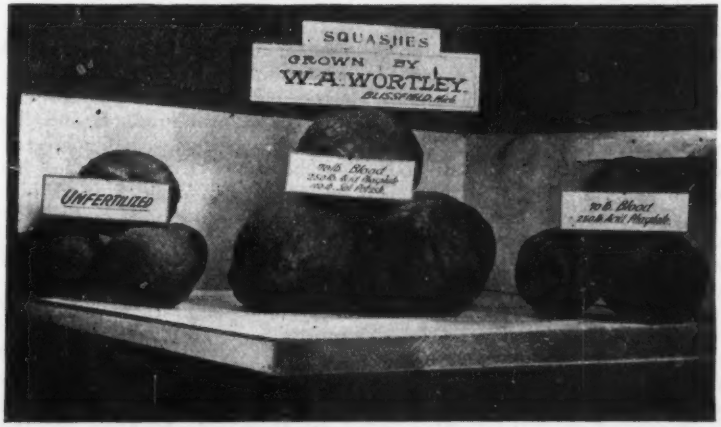
To make the most of any crop, intensive cultivation is a prime requisite. Maximum crop production requires intimate knowledge not only of the crop itself, but of its individual needs in the way of soil preparation, fertilization, cultivation, etc. Large yields and good quality are of paramount importance. Once these are assured, successful marketing becomes a matter of minor concern, for quality goes a long way in selling products at a profit.

Opportunities for producing cash crops on the farm were never better than now. Market demands are increasing daily. The supply is not keeping pace with these demands. This is especially true of vegetables. Expensive meats are popularizing the use of all garden crops. Squashes are coming in for their share of attention from both the market and production standpoint. They are easily grown, are very productive and respond most readily to intensive cultural methods. As a cash crop for market, garden and farm, squashes present attractive advantages. The experience of a Michigan grower, Mr. W. A. Wortley, of Blissfield, offers a valuable lesson of how the yield and quality of this crop can be enhanced by the addition of available plant food in the use of commercial fertilizers.

Fertilizer Per Acre in Pounds	Yield Per Acre in Tons	Increase Over Unfertilized in Tons
No Fertilizer	3.99	
70 Pounds Dried Blood 250 Pounds Acid Phosphate 100 Pounds Sulfate of Potash	6.05	2.06
70 Pounds Dried Blood 250 Pounds Acid Phosphate	5.58	1.59

As with all vegetable crops, rapid growth is very desirable. The soil needs plenty of plant food—food that can be made use of at once. Squash plants are quite tender and do best in a well-drained, warm, rich soil. Mr. Wortley has a sandy-clay loam, with a gravelly and blue clay subsoil. Manure has been liberally used in a cropping system, including wheat, timothy and potatoes. His results have been fairly satisfactory with these preceding crops but a desire to try out more intensive fertilization prompted a test with commercial plant-food. Somewhere he had heard that manure is an unbalanced ration, richer in nitrogen than in the mineral elements and that its use alone would tend toward more vine than fruit. Accordingly his squash field was given different treatments. The preliminary preparation of the soil was the same. Two days before the squashes were planted the following fertilizers were broadcasted on separate portions of the field: On one 70 pounds dried blood, 250 pounds acid phosphate and 100 pounds sulfate of potash; while on the other 70 pounds dried blood and 250 pounds acid phosphate only were used. Still another portion, of equal area, was left untreated. The planting was all done the same day, and the subsequent management of the crop was the same over the entire field. The season was not the best, being somewhat dry at a critical period in the crop's development. Bugs and blight were also the cause of some damage to the crop.

The plants in the fertilized plots made a quicker start, pushed ahead of those on the untreated ground, and remained (*turn to page 40*)



These are samples of the results secured by Mr. Wortley of Blissfield, Michigan, from the experiment described in this article.

¶Beyond a doubt the subject that most interests our readers is how to surmount the economic difficulties with which the farmer is faced. But before we can improve the present agricultural situation we must first understand it. ¶No article I have seen in recent months so clearly analyzes present conditions as Dr. Warren's contribution to The Quarterly Journal of Economics (February, 1924). ¶The following extracts from this article are reprinted through the courtesy of Dr. Warren and The Quarterly Journal of Economics. They will repay a very careful reading on your part whether you accept his conclusions or not.

The Agricultural Depression*

By G. F. Warren
Cornell University

ALTHOUGH we have had the most serious agricultural panic ever experienced in the United States, and are still in a period of severe depression, the situation is so little understood that there is some doubt whether a real depression exists. If one goes to enough farms in different parts of the country and learns of the private settlements with creditors by means of which great numbers of young men have lost their entire savings; learns also of the greater number whose debts are larger than their resources, but who are struggling along hoping for a way out—one will have no doubt concerning the grim reality of the situation. Since most persons must form their conclusions from the readily available statistics, and since it requires many years for the statistics to be collected and fully analyzed, it is not surprising that a long time is necessary before agreement is reached concerning the facts.

* * *

Effect of a Declining Price Level on Agricultural Prosperity

If all the farmer's money were used for the purchase of general commodities, he would be concerned with the price paid to producers for farm products and the price that he has to pay for retail purchases for living and for his business. But some farmers hire labor and are, therefore, concerned with the wages of farm labor and the quantity and quality of labor available. All farmers hire other labor, such as carpenters, blacksmiths, and the like, so that they are concerned with the amount of farm products necessary to hire these persons. One of the most important considerations is the

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payment of interest and taxes. Farmers, therefore, are concerned with the quantity of farm products necessary to make such payments. In so far as the money goes for these purposes, it is the money price of farm products and not their purchasing power that is important. For the farmers who bought farms in recent years and who are not out of debt, these items are the dominant ones. In a large measure they can stop buying clothing, farm equipment, and can greatly reduce expenses for food; but there is no way to escape taxes, interest, and payments on debts. The portion of the farming population that is in comfortable circumstances is most concerned with the comparative prices of what they sell and what they buy, but the portion of the population now in financial difficulty is concerned with the quantity of farm produce required to pay interest, taxes, and debts.

The taxes per acre paid by farmers in the United States for the year 1913-14 averaged $0.314 and in 1921-22 averaged $0.709 or an increase of 126 per cent. For the area as reported by the Census of 1920, this would call for an annual payment of $678,000,000. Since that time, taxes have continued to rise. What such an amount means is better understood when compared with the sales of wheat. For the last three years, the sales of wheat from American farms would about pay the land tax bill.

On farms in Ohio, Indiana, and Wisconsin, the business receipts less all farm business expenses except taxes, in 1913, averaged $1147 per farm. Taxes averaged $112 per farm; that is, taxes amounted to 9.8 per cent of the net income before taxes were deducted. Prices rose faster than taxes: in 1918 taxes represented only 6.7 per cent of net income. But when taxes rose and prices fell, the reverse was emphatic, for in 1921 the income above business expenses other than taxes dropped to $771 per farm, while taxes rose to $253, so that taxes required 33 per cent of the income. Expressed in another way, it required over twice as many hogs or beef cattle, two and a half times as much corn, or a half more than the pre-war amount of butter to pay the taxes.

Since much of the tax money goes for payment on bonds and much for payment of teachers' wages, there is little hope for a large reduction of taxes in the near future. Teachers' wages lagged behind prices when going up and when coming down, just as they did following the Civil War.

Normally, when a young man buys a farm, he assumes a debt that will require most of his life-time for payment. This is recognized by the Land Bank System, which allows as high as 33 years for payment. Interest and payment of principal will go on for years. Some of these obligations have been escaped by foreclosures, bankruptcy, or private settlement; but the major portion of the indebtedness will continue and be a fixed charge in dollars independent of future price levels. A long period of depression will reduce this item by transfers of property to new owners at lower prices; but this is a slow process, and is often disastrous to the seller.

The Census does not report mortgage debt for farms operated by tenants, nor is any personal indebtedness reported. But of the farms operated by owners 41.3 per cent were reported mortgaged. The average debt per farm was $3,356 and the average rate of interest 6.1 per cent. The farms averaged 148.2 acres. This would call for an interest payment of $205 per year. Personal indebtedness on many New York farms averaged about one fourth of the

mortgage debt. In the cotton country, personal indebtedness is larger. If personal indebtedness for the United States averages one fourth of the mortgage debt, the average total interest payment per farm would be about $256. If taxes on mortgaged farms are at the average rate per farm, they would amount to $105 per farm. The total payment of interest and taxes on these mortgaged farms would call for $361 per year. In 1922 the total probably came nearer to $400, as both indebtedness and taxes probably had risen. This amount may not seem large; but when it is realized that the total value of all crops produced on American farms in 1921 averaged only $1,075 per farm, and that the total sales of all products per farm are considerably less than this amount, the figures become more significant. If the averages are as given, it follows, of course, that large numbers have more than the average debt and are worse off than average figures indicate. Since the total number of owners whose farms were mortgaged was nearly a million and a half, the number who are not able to meet their interest payments is large.

AGRICULTURE is a very slow industry. If one raises a dairy cow, she is a constant source of expense for over two years. Production does not reach its maximum for several more years. The farmer hopes that the cow will pay for the investment in raising her by the time she is perhaps eight years old. If he raises a colt, it is a ten-to-fifteen-year investment. Tile drains are a fifty-year investment. A good farm barn is expected to pay for itself in about fifty years. Orchards in New York take fifty-four years to reach their prime. For such reasons, capital investment in agriculture is very high in proportion to receipts. The rate of turnover varies with the type of farming. For the entire United States, it probably requires an average of about eight years to make sales equivalent to the total capital invested. A decline in the general price level makes the period much longer. A business that has a turnover three times a year has as good a chance to get adjusted to deflation in a year as does agriculture in many years.

* * *

IT follows that agriculture is injured much more than is the usual type of city business by a period of declining prices. It is no accident that farmers are the one who become most critical when the purchasing power of the dollar is suddenly raised. Agriculture cannot prosper with a continuously declining price level.

How Declining Prices Are Met in Agriculture and in Industry

When prices of farm products drop very low, less hired help is kept, farmers work longer hours and omit all unnecessary things, and members of the family do more farm work. The lower the price goes, the more units of the product the farmer must have to meet his fixed expenses. It is true that the status of all farmers might be better if production were reduced, but the farmer is primarily concerned with his own individual status.

When an industry that depends on large numbers of hired workers cannot sell its products for enough to pay wages, it usually ceases operation until the supply of the product is so reduced that employment can begin. It usually begins with a wage-rate somewhere near to previous rates. In a period of rapidly declining prices, the supply of farm products is therefore likely to be kept high for a time, and the supply of manufactured goods kept at a premium. (*turn to page 61*)

The Seed

By Dr. Frank Crane

THE Seven Wonders of the World were by no means the most wonderful things in the world. ¶The wonders of life are thickest among the familiar, every-day matters. ¶Perhaps the most amazing, baffling, mysterious thing in all the universe is a seed. ¶Look at an apple-tree. All of its trunk form, the law of its branches, its leaves and their veins, its delicate blossoms, and its red fruit, were contained in a little, brown, hard seed. Open the seed and you see nothing but a whitish filling; yet that substance has powers as strange as mind, it has a plan that implies wood, flowers, and apples. ¶Out of my window in the morning I hear roosters giving their hoarse, peculiar call. They all sing practically the same tune. Once it was in the egg. Think of that yolk and white in the egg holding in itself the potentiality of a certain cry. And cocks crow now doubtless just as they crew in the Garden of Eden. ¶Take two particles of vital fluid; the microscopist can hardly determine a difference between them; yet from one comes a lion, with all his complicated organism of hair, nails, blood-vessels, viscera, nerve-threads, mental tendencies, characteristics; and from the other a man with a body as complex as that of the lion, and with a brain containing the thoughts, fancies, and spiritual functions of an intelligent being. ¶It seems uncanny when we consider a talking-machine and observe how the tones of a voice, or a piano, or a violin, or the full music of an orchestra, pass through the point of a needle. It seems impossible, a miracle. ¶And yet it is not so astounding as to note how a living being, a duck, a dog, an oak-tree, a rose-bush, concentrates all of its marvellous organism into an egg or seed, from which a similar organism is produced. ¶Not any of the sights of earth are comparable to the seed. The falls of Niagara, the cathedral of Saint Peter at Rome, the pyramids of Egypt, the peaks of the Himalayas, none of them is so overwhelming to a thoughtful mind as a little grain of wheat. ¶The miracle of miracles is life. And the seed is life's most miraculous manifestation. ¶The wonders of electricity, of radioactivity, of hypnotism, clairvoyance, and dreams, of the starry heavens with their stupendous masses and distances, of chemical affinity and the strange appetencies of molecules, of art and of invention, cannot, to me, compare with the seed, where there is condensed into a single, small, not very highly organized substance "all the physical, moral, and intellectual past and future of thousands of creatures." ¶If I were going to be a heathen man, and seek in nature some object to worship as God, some object embodying the infinite mystery of life, I should worship a seed.

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Prussic Acid Poisoning *in* Livestock *—a Real Problem*

By Albert A. Hansen
Purdue University Agricultural Experiment Station

(Here's another of Prof. Hansen's articles on poison plants without which no issue of Better Crops *is complete.*

DURING mid-September of the past year, three horses died suddenly in the pasture of John Berberich, a farmer of Cromwell, Noble County, Indiana. A neighbor who witnessed the death of one of the animals stated that it "tore around in a crazy sort of fashion, keeled over, kicked a few times and passed out." From the symptoms described, cherry poisoning was suspected and sure enough, investigation revealed a fallen cherry tree that had toppled over during a storm that had raged just about the time the animals died. An examination of the fallen tree revealed unmistakable evidence that the leaves had been grazed.

Almost the same description can be given of a similar incident on the farm of John Dellinger of Jeffersonville, Clark County, Indiana, except in this case the victim was a prize cow. She died under similar circumstances during June, 1923, in a pasture in which no animals had previously been lost. However, a storm had passed over the farm about the time the animal died and an examination a few days later was rewarded by the finding of a large limb of a wild black cherry that had fallen to the ground and showed evidence of having been grazed. On both of these farms it was clear that the trouble was due to prussic acid poisoning.

Experimental work has disclosed the interesting fact that, when the leaves of wild cherry (particularly wild black cherry) wilt, dangerous quantities of prussic acid are formed. Prussic acid is known to chemists as hydrocyanic acid and it is one of the most rapidly-acting plant poisons knows. The fresh leaves may contain this dangerous acid in small quantities—in fact some folks acquire severe headaches simply from smelling the flowers of wild cherry, which contain a trace of prussic acid—but the greatest danger is from wilted leaves. In other words, it is dangerous to break off cherry branches or mow cherry sprouts and allow them to wilt in places accessible to grazing animals. This is a little-known bit of information that should be part of the stock of knowledge of every farmer and particularly of agricultural extension workers.

THERE is one other class of plants in which prussic acid forms—the sorghums—and here again the

Sudan grass, a member of the sorghum tribe. Whenever sorghum or its relatives are wilted by frost or otherwise, the plants become poisonous to livestock.

danger lies in wilted plants, particularly in the second growth that has been wilted by frost. Ernest Trimble, a good farmer of Paoli, in southern Indiana, found this out last fall to his sorrow, and the knowledge cost him four of his best cows. Dr. Paul Lindley, the local veterinarian, attended the animals and he gave me an excellent account of the symptoms. "The animals were at first a bit drowsy; they became weak and staggered a great deal, just like an intoxicated person. The breathing became difficult and excited, the muscles twitched nervously, the saliva flowed freely and finally the animals fell in spasms and died in a short time. Death seemed to be due to inability to breath properly." In searching for the cause of the trouble the partly grazed and frost-wilted second growth sorghum was found. The same trouble has been experienced recently in Martin County, Indiana, and a number of horses died from the same cause in the vicinity of Norman Station in Jackson County. Prussic acid sorghum poisoning seems to be more or less common throughout Indiana wherever grazing animals are allowed access to the frosted second growth.

Technically, the trouble is due to the action of one of those mysterious things called enzymes on an equally mysterious glucoside. The main point in which the farmer is interested is that the formation of the dangerous prussic acid may take place whenever green sorghum is wilted (as during drought), and especially in the frosted or otherwise stunted second growth. Very little of such vegetation is necessary to cause fatal results, and death takes place so rapidly that it is practically useless to call a veterinarian. As in many other things, an ounce of prevention is worth a ton of cure. With the necessary information at his disposal, the farmer can guard against losses of this character. It is not always necessary to destroy sorghum thought to be dangerous since the prussic acid is highly volatile and disappears when the (*turn to page 38*)

STRAWBERRIES
and their Fertilization

THE strawberry has the widest range of climate and soil adaptability of any fruit now grown in America. It is being successfully produced both commercially and in the home garden, from Alaska to Southern California, and from Maine to Florida. Through careful breeding, varieties have been produced which are adapted to growth on each of the different soil types. The strawberry can, therefore, logically claim the title, "Most Cosmopolitan of All Cultivated Fruits."

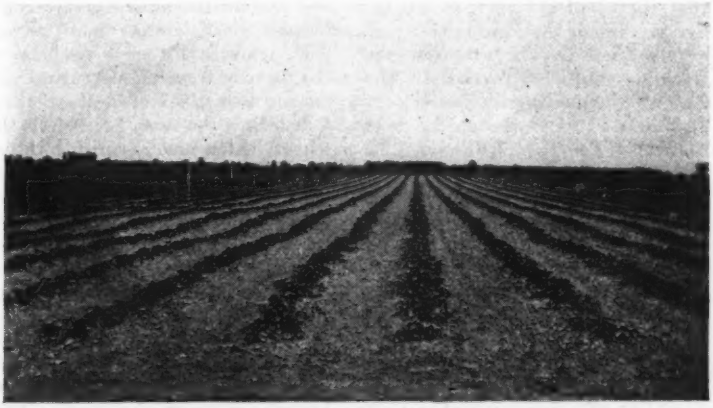
It is not difficult to raise strawberries under ordinary conditions. The plants may be successfully grown in the limited area of a home garden, or on an extensive scale embracing the cultivation and marketing of several acres. Among the many desirable characteristics which commend the strawberry favorably to land owners who would grow the fruit for either home use or for market, are the following: the facility with which the plant adapts itself to different types of soils and varied conditions of climate; the limited care and small cost attending planting and cultivation; the bountiful yields secured from well selected soils properly managed; the comparative freedom of the plants from insect pests and fungus diseases; the early maturity of the fruit and the regularity with which well established plantings return profits, greatly in excess of the cost

of production. Strawberries are one of the best paying crops that can be grown among the young trees until a new orchard comes into bearing.

IN its native home the straw berry delights in a rich, rather moist soil and cool season. The wide adaptability of different varieties, however, makes possible its growth on many types of soils. Any soil which is suited to the growth of ordinary farm crops can be readily utilized for strawberry production. Since earliness of maturity is a desirable characteristic, loam soils or those containing a considerable amount of sand are regarded with favor by most growers. Commercial plantings are usually located on mellow and "quick" soils of a sandy or sandy loam type. On account of their desirable physical characteristics, such soils are preferred to heavier types of greater potential fertility. Soils, deficient in plant food but in good physical condition, are easily and quickly brought to a high state of fertility under a system of management which includes the judicious use of manures and fertilizers.

While the use of manures and green crops is highly to be commended, one should not forget that the strawberry, like all other fruit crops, draws freely on the potash and phosphoric acid supply of the soil; nor should one overlook the fact that yard manure is not a well-balanced plant food, being deficient so far as the strawberry is concerned, in available supplies of both potash and phosphoric acid. Growers who resort to the use of green crops should bear in mind that, in a sense, they only turn over the mineral plant food supply of the soil, but do not add anything to the store of the mineral elements—potash and phosphoric acid.

CONSERVATIVE estimates indicate that two good crops of strawberries, including the production of the vine and the fruit, will remove, during the three years of growth of the crop at least 223 pounds of nitrogen, 375 pounds of potash and 83 pounds of phosphoric acid per acre. Since the crop is generally planted on soils of a rather light character, they will, in most instances, not be naturally as well supplied with potash and phosphoric acid as soils of a heavier type which contain more clay. In fact, the experience of practical growers shows that the use of these elements in con- (*turn to page 44*)



A well cultivated new strawberry field at Three Rivers, Michigan.

The original method of hot water treatment in Indiana.

KILLING *the* Loose

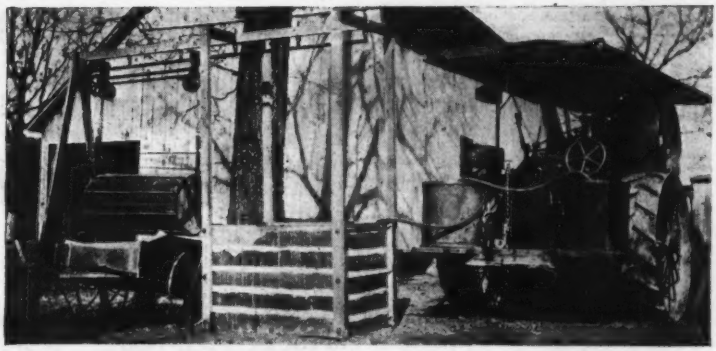
By C. T. Gregory

Purdue Agricultural Extension Department

IN the Spring of 1917 the farmers of Shelby county, Indiana, were forcibly reminded that the black heads or loose smut was taking an undue share of their wheat. That year they had as much as thirty-five percent of their crop destroyed by the disease. The situation was alarming and they called on the Purdue Agricultural Experiment Station to know what could be done to rid their fields of the disease. The extension specialist told them about the peculiar nature of the disease and advised them that the only way out of their troubles was by the hot water route, the Jensen's hot water treatment. These Shelby county farmers were game to try anything.

In the fall of 1917 a few of the hardier souls let these extension men "scald" their wheat. They certainly thought that the wheat was cooked when they saw it being rolled around in water so hot that they could hardly bear their hands in it. Some of this treated wheat did not come up very well that Fall and in some cases the county agent, Russell East, almost had to beg with tears in his eyes to prevent the farmers from plowing it up. In one or two cases even these tears failed but the men who left the wheat had a nice surprise in store for them. This supposedly dead wheat produced a crop that was entirely free from the smut, and had three to five bushels more per acre than the untreated wheat.

From this rather inauspicious start the hot water treatment has spread till hundreds of farmers in about fifty counties of the state are using it and there are thousands of bushels of smut-free seed. But, how has Indiana made practical this



Bill Shrode's portable treating tank used in Posey County, Indiana. He takes out five bolts and the whole tank and the A shaped 2 x 4's come down. He puts it all in a trailer and drags the two-wheeled cart behind.

SMUT *of* Wheat

more or less theoretical laboratory practice? It has all come about by slow experience and hard knocks. At first the men dropped the bags of soaked wheat in the hot water, rolling them around as best they could before snatching their hands away. They decided that this slow parboiling of the hands would never do, and devised the scheme of tying loops of binder twine at each end of the bags. This permitted them to agitate the wheat without getting their hands in the water. Of course it is necessary to presoak the wheat at least four hours before treating it, and during this time the seed will swell to about twice its usual size. A good many bags were burst because the farmers did not realize this and put too much dry wheat in the sack. We recommend now that only a half bushel be put in a sack and, moreover, that only a burlap sack be used. A tightly woven grain sack will not permit the free circulation of the hot water.

IN Shelby county the demands for wheat treatment piled up till county agent East was swamped. Six hundred or more bushels of wheat cannot be treated in a short time by the slow methods then in vogue. East put on his thinking cap and with suggestions from F. J. Pipal, the Purdue specialist, he devised the tank and drum which did take care of all the wheat the farmers could bring in. The drum is made of heavy iron screen and is capable of treating five bushels at a time. The tank is large enough so that the drum can fit snugly in it and the water is heated by steam. This method went (*turn to page 41*)

The Editor's C

THE FUTURE OF FARM PRICES

What will be the trend of prices for farm products in the next few years? Will they go up or down? These questions, I believe, are giving more concern to agriculturists than any others. I know that the readers of BETTER CROPS are thinking about them very seriously. In future issues I hope to have the subject discussed from various angles.

In this month's issue, you will find some excerpts from an article by Dr. G. T. Warren, of Cornell University, on this subject. Dr. Warren's conclusion is that the general tendency of prices for farm products will be downward for some time to come, and on the basis of this assumption, he predicts some of the results that would follow.

It is always difficult to look facts squarely in the face, particularly when they are the reverse of what we would like. BETTER CROPS and its readers, however, would be shirking their responsibilities if they refused to consider frankly what further depression of farm prices may mean.

At first we are likely to feel discouraged, but to accept the facts is not necessarily to abandon all hope and effort. Rather should it summon everyone of us to straighter thinking, better planning and harder work than ever before.

Let us always keep in mind this great fact—that every human being is dependent upon agriculture for his very existence and that, unless it prospers, nothing else can prosper for long.

There will, of course, be those who will counsel the farmer to reduce his crops, to abandon all progressive enterprises and simply sit tight. That to my mind is unsound advice. I believe that any farmer who follows such advice will soon find himself among the "unfit"—the down-and-outers.

The big thought I got out of Dr. Warren's article was this: whatever the future trend of prices, the soundest policy is to concentrate on increased efficiency. This may sound simple,

but, in fact, it is an extremely complicated problem. The industrial manufacturer in the interests of efficiency can change his plans and his equipment almost over night; the farmer must plan for years ahead and, once started on, a plan, it is generally impossible to change.

Since the farmer is a "piece worker" it is out of the question for him to stop producing. Increased efficiency means that he must get more from his investment, more from his land, and more from his workers than heretofore. As Dr. Warren himself points out in a bulletin which we reviewed last month, the importance of saving labor will be greater than ever and for some men this means tractors, trucks, milking machines, better barn arrangement, driving more horses per man, always remembering to exercise great care in buying anything that is much above pre-war prices unless it will pay for itself quickly.

In the matter of crops this means that, in preference to increasing acreage, the farmer should endeavor to increase the yield and quality of his present acreage. It means greater attention to permanent soil fertility. The farmer who can make two ears of corn grow where only one grew before will have more of an advantage than ever. Farms with large yields of high quality will have a greater advantage than ever over those with low yields and ordinary quality.

Pray, reader, meditate upon this point. Whatever your relation to the farmer, if you can show him how to get better and bigger crops by more efficient methods, not only will you render him a great service but society itself will be in your debt.

It was with this very definite ideal in mind that we named this magazine BETTER CROPS.

Yours to a cinder, Jeff McDermid

1
RISES EARLY, FINDING NOTE ANNOUNCING DAUGHTER'S FLIGHT WITH CITY CUR.

2
POLISHES SHOT GUN FOR HALF AN HOUR.

3
DISCOVERS HIRED MAN HAS SET FIRE TO BARN.

4
OPENS LETTER ANNOUNCING FORECLOSURE AT 2 P. M.

5
MA PLEADS WITH HIM NOT TO LOSE FAITH

6
DISCOVERS SON HAS FLED, TAKING LAST LIBERTY BOND FROM CLOCK.

7
DISINHERITS SON AND PUTS LAMP IN WINDOW TO GUIDE HIM HOME.

8
FINDS DROUGHT HAS DESTROYED TURNIP CROP, LEAVING HIM PENNILESS.

9
FEELS THE ODDS ARE AGAINST HIM AND SEEKS COMFORT.

The American Farmer May Think He Has It Hard—

10
Unseasonable Snow Storm Brings Back Daughter and Her Little Child, Effie.

11
Sheriff's Men Start Taking Furniture Out of the Old Home.

12
But Little Effie has Touched Heart of the Old Miser, Who Tears up Mortgage.

13
Cheerfully Carries all the Furniture Back into House.

14
Just as He Sits down to Supper Hears Pitiful Cry from Out of the Night.

15
Plunges Into Such a Storm as Few Men Can Remember.

16
And in it Finds His Son, Who has Repented and made His Fortune in the City

17
Weakened by Exposure Battles with the Grim Reaper for an Hour or More.

18
Then Goes to Bed so as to be Ready for Hard Day To-morrow.

—*from Life.*

But He Has a Cinch Compared with the Movie Farmer

A Few Corrections

Dear Mr. McDermid:

In BETTER CROPS for March, 1924, you have an article entitled—The Chinese Burbank of Florida's Citrus Industry—in which several ridiculous and extravagant statements are made. On page nine is this statement concerning the perfumed grapefruit—"The perfumed grapefruit is the progeny of a cross of the pomegranate on the ordinary grapefruit with much oriental magic injected into the union." Perhaps Mr. Dacy does not know that the grapefruit and pomegranate belong to entirely different botanical families, and that a cross between two groups as widely separated as these are is impossible. According to Bailey's "Manual of Cultivated Plants" the grapefruit is Citrus maximea and belongs to the family Rutaceae, whereas the pomegranate, Punica granatum, belongs to the pomegranate family. There are no instances in record of family crosses and there probably never will be. Also I would appreciate a statement as to how this oriental magic was injected into the union. With a silly statement of this nature Mr. Dacy is trying to make a mystery out of a simple matter. The whole operation was simply a matter of placing the proper pollen on the stigma of the flower, saving the seeds from the resulting fruit, planting this seed and selecting the best tree from the seedlings. Any good citrus grower could make the cross and should have very little difficulty in picking the best seedling from the lot. Certainly there is no opportunity for a display of oriental magic. A knowledge of citrus varieties and a little common sense would go much farther in practical plant breeding. If the truth were told in a simple manner, others might be encouraged to try their hand at plant breeding, resulting in more improved varieties. As the statement was made it would certainly discourage anyone except a Chinese magician from citrus breeding and improvement.

On page 63 in the same article mention is made of an early apple maturing in late June in latitude of Central Massachusetts. This seems an impossibility as apples do not bloom in that latitude until after the middle of May and the earliest varieties do not ripen until the very end of July or early August. I would certainly appreciate information as to where I may obtain propagating wood of this remarkable variety.

On the same page the writer mentions the cherry currant as having been originated by Lue Gim Gong as a cross of the grape and the cherry. Such a statement may be interpreted in several ways and none are correct. To say that the currant—Ribes is produced by crossing the grape—Vitis with the cherry—Prunus, is to make the most ridiculous statement I have ever seen in print. Yet, apparently that is what Mr. Dacy meant and it certainly requires no stretch of the imagination to give the statement that interpretation. If it is meant that the variety of currant known

as Cherry was produced by crossing the variety Grape and the variety Cherry this may also be disproved. The variety of currant known as Cherry is thought to have originated in Italy, it was known in France in 1840 and was introduced into America in 1846. Lue Gim Gong must have been an old timer to have produced this variety. Again it is very difficult, almost impossible to grow currants successfully as far south as Florida and a man of Lue Gim Gong's horticultural ability certainly would not waste his time with that fruit.

I would suggest that if you wish to have your publication—BETTER CROPS—taken seriously, that you discontinue such fiction as appeared in the article by Mr. Dacy. I am very curious to know why such ridiculously silly and untrue statements were ever published in a magazine which supposedly circulates among agricultural readers.

Very truly yours,
(*Sgd.*) GEORGE L. SLATE.

Several other letters have been received expressing substantially the same criticism as Mr. Slate. Mr. Slate's letter was referred to Mr. Dacy. We quote from his reply:

"I reported that story as accurately as I possibly could. The interview was had at Lue Gim Gong's grove down here in Florida. I spent about six hours with Lue during which he told me the experiences of his life.

"He made a very mysterious matter of the perfumed grapefruit and it was not until I had asked him repeatedly that he finally gave me the information covered in the story. For a number of years, Lue lived in Massachusetts with his foster mother, Miss Burlingame. It was there that he successfully performed the experimentation with the early apple and the cherry-currant. . . . I am very sorry if any of the statements in the article were misleading. . . . I took any information which Lue Gim Gong gave me as wholly accurate, and I am positive despite what this scientific critic says that Lue has performed grapefruit and cherry-currant experiments. . . . If there is anything that I can do to aid you in rectifying any false impressions created by what this critic calls 'ridiculous and extravagant statements' in the Lue Gim Gong story, you may be assured of my cooperation."

I sent a copy of Mr. Dacy's reply to Mr. Slate and asked his permission to publish his original letter. He replied.

"I have no objections to your publishing my letter with any comments you or Mr. Dacy care to make. I hope I have not given the impression that I was trying to belittle the work of Lue Gim Gong. My criticism was meant entirely for the writeup of his work which contained several rather ridiculous and extravagant statements. It is my knowledge that reputable horticulturists think highly of the Lue Gim Gong variety of oranges. I hope that I did not offend by the sarcastic tone of my previous letter. . . . I can easily see how one not familiar with plant breeding might allow such inaccuracies to creep in.

"Trusting that this matter is settled to your satisfaction, I am

Very truly yours,
(*Sgd.*) GEORGE L. SLATE."

Our aim is naturally to publish only accurate and truthful statements, but like every human enterprise we are liable to let mistakes creep in. However, we welcome corrections or the expression of different points of view and will endeavor to present them to our readers for their own judgment.

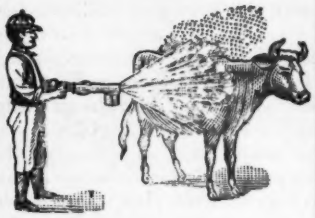
Jeff McDermid

Prussic Acid Poisoning

(*From page 27*)

wilted plants are allowed to recover or else are cut, dried and utilized as hay.

We have two other plants in Indiana that form prussic acid in dangerous quantities when wilting, and they are Johnson grass and Sudan grass. We have warned our farmers not to pasture animals on the young wilted plants of either of these two species, and we have not learned of any losses from this source. Our greatest trouble has been from wilted wild cherry and frosted second growth sorghum. Since the odor of prussic acid is very characteristic—it is the same odor so noticable in almonds and peach kernels—some folks say one can always detect its presence by the sense of smell, but we prefer to use our common sense by not running any risks whatever.



HAMMOND'S
Cattle Comfort

Keeps flies off. Makes cows more comfortable — they give more milk.

Write for Information

HAMMOND'S PAINT & SLUG SHOT WORKS
Beacon, N. Y.

Hammond's Slug Shot

Used from Ocean to Ocean

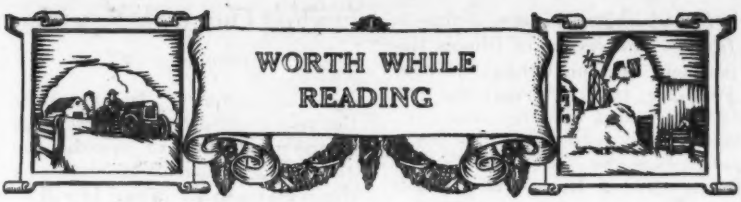
HAMMOND'S SLUG-SHOT
1880 1915
USED SINCE 1880.
AN INSECTICIDE FOR GARDEN USE
TRADE MARK

A light, composite, fine powder, easily distributed either by duster, bellows, or in water by spraying. Thoroughly reliable in killing Currant Worms, Potato Bugs, Cabbage Worms, Lice Slugs, Sow Bugs, etc., and it is also strongly impregnated with fungicides. Put up in Popular Packages at Popular Prices.

Sold by Seed Dealers and Merchants.

Send for Pamphlet Worth Having

HAMMOND'S PAINT & SLUG SHOT WORKS
Beacon, N. Y.



Producing Potatoes

Costs and Farm Practices in Producing Potatoes by W. C. Funk, Assistant Farm Economist, Bureau of Agricultural Economics. U. S. D. A. Department Bulletin No. 1188, April, 1924. 10c a copy.

As a contribution to greater efficiency in potato production, this bulletin takes a high place. How to raise and market potatoes at a profit is a subject of keen interest to every potato grower. While this bulletin does not offer any direct answer to that question, it presents facts that should materially help potato growers in the business management of their farms.

The bulletin is based on a survey of nine-surplus-producing areas in Maine, New York, Michigan, Wisconsin and Minnesota. It presents data on costs and farm practices; the relation of production in these areas to the production of the entire country; and the trends of production, prices and costs for the past quarter century. Excellent maps and charts serve to illustrate the main points. An unusually sound piece of work, recommended to all who are interested in potato production. B. H. P.

For Bird Lovers

Birds of West Virginia—Their Economic Value and Aesthetic Beauty by I. H. Johnston, State Ornithologist. Compiled and published by State Department of Agriculture, Charleston, West Virginia, 1923.

Although this is not a new publication, it deserves mention as a splendid example of educational and social service. Its hundred and thirty-eight pages are devoted to fine color reproductions of the birds most frequently found in the state. Each species is fully described, and Mr. Johnston adds the results of his personal observations and experiences in a style that makes fascinating reading. B. H. P.

All About Alfalfa

Guide Posts Along the Alfalfa Trail by H. L. Walster, North Dakota Agricultural Experiment Station, Circular 59, February, 1924.

This is another example (may they grow and multiply) of a splendid piece of practical extension work. It is timely, interesting and thorough, covering almost every phase of alfalfa production. Back of it all is much scientific research and experimentation, but the results of this work are not put down in dry, musty form. Mr. Walster has contrived to make his bulletin *readable* and attractive to the eye. While he is writing with the farmers of North Dakota particularly in mind, his work covers the subject so well that it should be of value to anyone interested in growing alfalfa. B. H. P.

Noteworthy Publications

Control of Potato Tuber Diseases. U. S. D. A. Farmers' Bulletin 1367.

Utilization of Pima Cotton. U. S. D. A. Department Bulletin 1184.

Marketing Southern Grown Sweet Potatoes. U. S. D. A. Department Bulletin 1206.

Directions for Spraying Fruits in Illinois. University of Illinois Experiment Station, Urbana, Illinois. February, 1924. Circular No. 277.

A Plan for the Farm Garden. University of Illinois Experiment Station, Urbana, Illinois. February, 1924. Circular No. 278.

Cotton Growing in Illinois. University of Illinois Experiment Station, Urbana, Illinois. March, 1924. Circular No. 279.

Nitrogen — Carrying Fertilizers and Bearing Habits of Mature Apple Trees. Agricultural Experiment Station, Michigan Agricultural College, East Lansing, Michigan. January, 1924. Special Bulletin No. 127.

An Analysis of the Peach Variety Question in Michigan. Agricultural Experiment Station, Michigan Agricultural College, East Lansing, Michigan. January, 1924. Special Bulletin No. 126.

Soybeans—Their Use and Culture in Southern Minnesota. The University of Minnesota, Agricultural Extension Division, University Farm, St. Paul, Minnesota. February, 1924. Special Bulletin No. 82.

Onion Growing in North Dakota. Agricultural Experiment Station, North Dakota Agricultural College, Agricultural College, N. D. February, 1924. Bulletin 173.

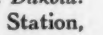
Culling Seed Corn. Agricultural Extension Division, North Dakota Agricultural College, Agricultural College, N. D. March, 1924. Circular 60.

Finding Out with Squashes

(*From page 21*)

ahead all summer. In harvesting the crop careful records were kept of the production of squashes on each plot. The yields are shown by the accompanying table. It will be noticed that the complete fertilizer gave considerably better results, amounting to an increase of more than two tons per acre over the unfertilized crop, and about one-half ton increase over the crop where no potash was included in the mixture.

The yield results, however, do not tell the whole story. The use of the fertilizers also made a big difference in the quality of the crop. This result was fully as striking, if not more so, than the difference in the yield. The photograph clearly shows the greatly improved quality of the completely fertilized crop over that of the other two plots. As a market crop, the value of properly fertilizing squashes should not be underestimated. The experience of this Michigan farmer is worthy of thoughtful consideration. He has proved to his own satisfaction that it pays to feed crops well. What he has found out, by actual field experiment under normal farm conditions, should be of universal use to farmers. Squashes will make money for any one who will provide them with a well-prepared soil in which to live, and see that they are properly and plentifully fed during growth.



What does the future hold for American farmers? Is prosperity in sight —and when? Read the masterly discussion of this subject, "Looking Ahead," by A. B. Ginung, Economist, U. S. Department of Agriculture, in the June BETTER CROPS.

Killing the Loose Smut of Wheat

(*From page 31*)

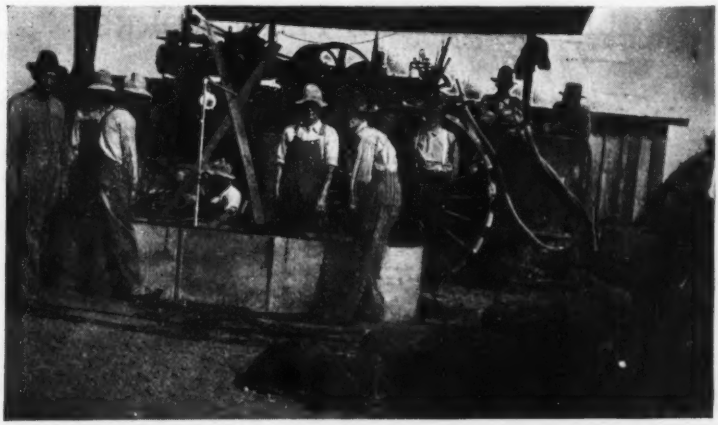
merrily. East could handle any where up to a thousand bushels a season.

W. E. Shrode in Posey county, and W. J. Piggott in Knox county decided that they could do more by moving the treating apparatus around to the different communities. They devised a movable type of treating tank that was just like that used by East, but which could be taken apart, piled on a truck or a Ford trailer and moved wherever they desired. They usually had a threshing engine to supply the steam, but sometimes the apparatus was placed at an elevator or a creamery where steam could be obtained.

In recent years it has become necessary to establish stations in many communities and at a much smaller cost. We use any large tank like a horse trough or a large galvanized iron tank and run a threshing engine along side of it to supply the steam. Each farmer treats his own wheat by the sack method, and since five or six men can stand around the tank it is easy to treat twenty or more bushels an hour. It is customary to treat enough seed to plant one field from which the seed for the following year is taken. Incidentally some of the neighbors may get their seed from that field also. Last year Indiana had over 50,000 bushels of such seed and that is not counting the wheat that was two or three years from treatment.

The Shelby county farmers still have some loose smut because it is not possible to get rid of any disease completely in a whole county, but they no longer as "What shall we do?" They know that the hot water treatment will get rid of it. We claim that Indiana has shown that the hot water treatment is not a laboratory plaything. The farmers can use it and are doing so.

You can't get away from the nemas —because they're everywhere. So you'd better learn about them from C. E. Gapen's article "The Nema—Friend and Enemy" in June BETTER CROPS.



A group of Clinton County farmers who treated about a hundred bushels of their wheat.

OLIVER

BETTER PREPARATION — BETTER CROPS

One acre of ground properly prepared for seeding is worth two acres that is deficient in available plant food and that is full of clods and air spaces.

Preparation of the ideal seed bed involves an application of the proper fertilizer, if the soil is deficient in any of the available plant foods, and in properly discing, plowing and firming the soil until it is uniform from surface to subsoil.

Before plowing use the disc on the surface, cutting all trash and mixing it with the surface soil. This will eliminate clods and air pockets. Next plow the land, using a combined rolling coulter and jointer, so that all weed seeds and eggs and larvae of insects may be laid on the bottom of the furrow. Then, as a final preparation, use disc and pulverizer in pulverizing and firming the soil.

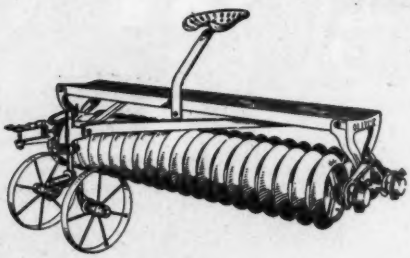
The result will be a seed bed that will be the greatest asset to the farm and to the farmer.

OLIVER MANUFACTURES THE CORRECT IMPLEMENT FOR EACH PHASE OF SEED BED PREPARATION

OLIVER CHILLED PLOW WORKS

Plowmakers for the World

South Bend, Indiana



How I Developed Clubwork

(*From page 19*)

an opportunity to grow a pig into a hog. I sent a letter out to each of them to ascertain just how many would care to have one or more hogs ready for a cooperative sale by the 15th of March.

As a result of this I received official notice from 100 boys and girls to the effect that they thought much of the plan and they were desirous of taking a part. Most of them had pigs with which to start and arrangements were made with their parents for both pigs and the feed. During the feeding period I visited as many of them as I could. On the 9th of March, we had the first sale. It was conducted on a cooperative basis. Local and other buyers were invited to submit a bid. There were three bidders present for the first sale, and the price received was within 60 cents of the Louisville market. We held two other sales in marketing these hogs. The average price was 60 cents within the market, and it appeared that every one interested was entirely satisfied with the project.

In summing up the results of this project for the first year, I find a number of interesting features, and much encouragement for the work the coming season. In the first place it has shown the people the importance of marketing all farm products in a cooperative manner, the practical advantage of every farmer working in perfect harmony with his neighbor. This feature has surely stimulated interest. Later we had a small wool pool in which the growers realized 58 cents per pound for their product. It also taught the boys and girls many lessons about feeds and feeding. There was at once set up a stronger desire among the boys and girls to conduct a similar project again the coming season.

It has also demonstrated a practical method of selling feeds which our farms are capable of producing. For many years our people have undertaken to sell raw material from the farm. This is gradually being eliminated from the common farm practices here and I firmly believe this demonstration has had much to do with doing away with this impractical method of farm practice. These boys and girls have also learned many lessons of thrift. Many of them at once purchased pure-bred pigs to be shown in the coming Fairs. This was an important feature of the project, as we are learning with a great deal of rapidity that we must rid our farms of every scrub animal if we are to realize a *greater profit* from the farms. Others deposited money in banks. It has also taught economy in producing feeds at a less cost, which means that hogs may be fed more cheaply, producing more profit. It has given our club work a more prominent place in the minds of our boys and girls and I am anticipating that greater results will be realized year after year, and that our work will be given its proper place among the people of this County.

Missiles and Mignonettes

I am very much interested in BETTER CROPS.—*C. M. Yerrington, Custer, Montana.*

BETTER CROPS for March is fine. Keep it coming.—*O. M. Olson, Clay, Minn.*

More power to you.—*Mrs. Mary E. Brooks, Quitman, Miss.*

Enjoy your magazine.—*J. R. Neale, Campbell, Wyo.*

BETTER CROPS is going across big with the County Agents and college staff. You are giving us some good stuff in a very readable way.—*H. W. Warner, Soils Specialist, Iowa State College of Agriculture, Ames, Iowa.*

Strawberries

(*From page 29*)

siderable quantities has been most helpful in improving the quality of the berries for shipping purposes. In other words, when potash and phosphoric acid are not supplied in sufficient quantities, either from the soil or from artificial sources, the berries do not stand up well, and many a grower has been disappointed at the market returns from his crop until he found out that he could improve the shipping quality of his berries through the judicious use of potash.

From the foregoing, it appears that in a majority of instances, the use of a complete fertilizer will be found desirable. The year the plants are to be set out, however, the chances are that comparatively little nitrogen need be used in the fertilizer formula. According to the figures presented above, through the three years which normally constitute the life of a strawberry bed it will require no less than 500 pounds of acid phosphate, 16% available, and 750 pounds of muriate or sulfate of potash to supply the mineral requirements of the crop. Such being the case, there should be applied to each acre, before the plants are set out, at least 300 pounds of sulfate or muriate of potash and 300 pounds of acid phosphate. On sandy, thin lands these amounts should be increased to 500 pounds in each instance, and there should be applied in addition, 100 pounds of dried blood and 100 pounds of sulfate of ammonia, or their equivalent of other nitrogenous materials. The fertilizer may be broadcasted or placed in a shallow furrow made by the turning plow directly in the line of the row where the plants are to be set. The furrows should then be drawn together and the plants set over the line of fertilizer but not directly in contact therewith.

In the spring of the first producing year, scatter uniformly over the rows about 400 pounds of a mixture made up of

400 pounds Muriate or sulfate of potash,
1,200 pounds Acid phosphate, 14%, and
300 pounds Dried blood, 13%.

The ingredients should be thoroughly mixed together, and when scattered on top of the mulch, will work their way down and will become sufficiently mixed with the soil through the cultivation of the crop to answer every purpose. During the second producing year the same treatment is advisable. The experience of practical growers indicates that even on the best soils, as much as 1,000 pounds of a mixture similar to the above, can be used, and on thin soils as much as 2,000 pounds in the course of the three-year period under discussion.

Some may prefer to apply the fertilizer on the basis of a formula containing definite percentages of plant food. In that event a mixture containing

Potash - - - -	9 to 10%
Phosphoric acid -	6 to 8%
Nitrogen - - -	2 to 3%

is advised, the rate of application per acre being the same. The higher percentages should be used on thin or sandy lands, and the lower percentages on the heavier and loamier soils. Those who desire to use sulfate of ammonia as a source of nitrogen, will probably find it well to lime their lands at the rate of one ton per acre, using the raw ground rock for this purpose. The lime should, of course, be put on some time in advance of applying the fertilizer. The farmer who depends on yard manure or a green crop, plowed under, as the sole source of his fertilizer, will be disappointed in the yield obtained from his strawberry bed, for even if he apply as

much as ten tons per acre of manure which has not been exposed to the weather, he will only furnish the soil about 100 pounds of nitrogen, 70 pounds of phosphoric acid and 100 pounds of potash. Compare this with the estimated amount of plant food removed by a crop in a period of three years and see how totally inadequate it is to supply its plant food needs.

Some will argue that the soil will yield up a large quantity of the mineral elements needed. While this depends much on its natural fertility, not over .25% of the total potash supply and 1% of the phosphoric acid contained to a depth of 18 to 24 inches will, according to the best authorities, become available to the growing crop, and this will only take place under the most favorable conditions of culture and management. Supposing a soil, therefore, contains as much as 100,000 pounds of potash, 250 pounds of this element might possibly become available in addition to that furnished by the manure. This would only supply 350 pounds per acre, where a conservative estimate says 375 pounds would be required. All authorities agree that not over 70% to 80% of the elements supplied to the soil in commercial form are assimilated, and it is likewise known that there is a considerable loss of plant-food from all soils of a loose, mechanical character through leaching. These facts are presented to convince the doubtful planter that the idea of supplying mineral commercial fertilizer in adequate quantity to his strawberry patch is not based on theory alone, but on the discoveries of man through a study of the relation of plants and soils to each other and to the economical production of crops.

That fertilizers can be used with profit for strawberry growing is demonstrated by the data presented in the following table which illustrates the benefits which may be expected from the intelligent use of fertilizers. The figures are taken from an experiment conducted by Mr. C. F. Smith, of Cheboygan, Mich.

Plat	Fertilizer per Acre in Pounds	Yield per Acre—Quarts	Increase over no Fertilizer—Quarts
1	No Fertilizer	980	
2	100 lbs. Blood 310 lbs. Acid Phosphate 130 lbs. Sulfate of Potash	1340	360
3	100 lbs. Blood 310 lbs. Acid Phosphate	1140	160

Complete Fertilizer with Potash. *Incomplete Fertilizer without Potash.*

Three plats of one-tenth acre each were used in this test. The first received no fertilizer; the second, a ration of 100 pounds of blood, 310 pounds of acid phosphate and 130 pounds of sulfate of potash; the third, a ration of 100 pounds of blood and 310 pounds of acid phosphate. The increase over no fertilizer on Plat 3 was at the rate of 160 quarts per acre. At ten cents a quart this would pay a handsome profit per acre on the fertilizer. Where the complete ration, with potash, was applied there was an increase of 360 quarts per acre, which, at ten cents a quart, would be equivalent to $36.00. Notice that when sulfate of potash was added at the rate of 130 pounds per acre, there was an increased yield of 200 quarts, equivalent, at ten cents a quart, to $20.00 per acre. This would indicate that the statement made with reference to the use of potash on soils devoted to the cultivation of strawberries were fully justified. These results were obtained in an extremely dry season when the yield of berries was much below the normal. From two to three times the increase indicated may be expected in an average season.

The results of another demonstration which was conducted, however, in the South by Mr. Sargent Pitcher, Hammond, La., are also interesting and can best be presented in tabulated form.

Plat	Fertilizer per Acre in Pounds	Yield, Per Acre		Cost of Fertilizer	Value of Crop Less Cost of Fertilizer
		Cases	Crop Value $	$	$
1	800 lbs. fertilizer generally used by growers analyzing: 8% Phosphoric Acid 2% Ammonia equal to 1.6% Nitrogen 2% Potash	158-⅓	158.33	8.00	150.33
2	190 lbs. Dried blood 16% 665 lbs. Acid Phosphate 16% 265 lbs. Muriate of Potash	245-⅔	245.62	16.03	229.59
3	190 lbs. Dried Blood 16% 665 lbs. Acid Phosphate 16%	130	130.00	10.07	119.93

Increase in value of crop per acre, by using a well balanced complete fertilizer, over that generally used ..... $ 79.26 (2 over 1)
Net profit due to Potash alone ..... 109.66 (2 over 3)

The fertilizer applied to Plat 2 was at the rate of 1,200 pounds per acre, and analyzed 2½% nitrogen, 9% available phosphoric acid and 11% of potash. The fertilizer on Plat 3 contained no potash whatever. The results show conclusively that the fertilizer generally used by the growers does not give the best results. It contains too little nitrogen and much too little potash. In this test the fertilizer was applied on each side of the rows after the plants had been allowed a month's growth. The plants on Plat 2, which received a well-balanced ration, in addition to yielding the largest crop, looked superior throughout the season.

Here are the plans of some of the County Agents for the coming season

Work on Soil Improvement, by terracing, liming, livestock and leguming. Raising more food and feed crops; push the cow, sow, hen idea in our livestock part of food (and cash crops) part of our program; and legumes, especially in our feed part of program. Cotton clubs for men, three acres—boys, one acre. Each member to plant registered seed,—prizes about $500 in all. Junior work, besides the cotton club to further specialize on pig club. We have over 50 pig club members, who each are to give the choice gilt out of first and second litters to other club members, who are to do likewise—this through County Agent.—*R. L. Blackwell, Gordon, Ga.*

Put on T. B. eradication campaign. Push soys and sweet clover. Boost club work and more economical production of farm crops and livestock.—*C. M. East, Gibson, Ind.*

T. B. testing of cattle. Pushing alfalfa and sweet clover and starting several soybean variety tests. Five acre corn contest. Liming acid soils. Introducing new variety of wheat. Using certified seed potatoes. Pooling wool and demonstration on wool grading. Pig, lamb, corn and potato club work for boys and girls. —*"Hank" Schroeder, Grant, Ind.*

Multiply last year's soy bean acreage at least four times. Keep four hundred boys and girls interested in Club work. Clean county of T. B. livestock. Put out a large corn acreage. Control the Chuick bug. Improve the orchard conditions. Raise more and better livestock.—*L. C. McIntosh, Benton, Ind.*

Enroll more boys and girls in club work than any other county in Kansas. Triple our acreage of sweet clover, soy beans and alfalfa. Conduct a Livestock Tour. Increase the acreage of the varieties of corn best adapted to our section of Kansas. Fish in every stream within 25 miles of Emporia. And read BETTER CROPS.—*Cecil L. McFadden, Lyon, Kansas.*

Boys and girls club project—emphasis on baking, garment making, poultry, dairy, calf, dairy judging, ton litter and sheep. Development of poultry program improved housing, culling-breeding, feeding and marketing organization. Lime and fertilizer demonstrations. —*K. A. Kirkpatrick, Hennepin, Minn.*

Clean up T. B. in all herds. Organize for Cooperative Marketing of eggs and poultry. Enroll 300 boys and girls in junior club work. Establish six soil demonstration fields. Establish three sugar beet demonstrations. Inspect Trumbull wheat for fall sowings. Give six demonstrations on treating hogs for worms with capsules.—*R. A. Cane, Fulton, Ohio.*

Put across the work of three newly organized cow testing associations under the circle plan. Testing at one place. Hold numerous tours and demonstrations on the adapting of vetch to this county for hay. Showing under what method of cultivation, fertilization and innoculation it will prosper.—*J. R. Beck, Lincoln, Ore.*

Have planned two corn variety tests, one oats variety test, a county judging contest, four boys' and girls' clubs, an extensive legume campaign, T. B. eradication work, and a bunch of demonstrations, as pruning, culling, caponizing, bee-keeping, etc. Spring work well under way and farmers are very busy, which keeps me busy too. —*H. O. Wilcox, Huntingdon, Pa.*

Organize a bull association among a community of farmers located in the Black Hills National Forest. Start the growing of field peas and oats mixed as a forage crop for milk cows in the high elevations of the National Forest. Re-organize the old county fair into a livestock as started last year based principally on the livestock shown by the boys and girls, who will be the foundation of this show. The first one in 1923 was successful.—*Evan W. Hall, Lawrence, S. D.*

A soil survey covering need of lime using the "SoilTex" test. We expect to use junior club and school workers to gather samples. This is part of a longtime campaign for more efficient crop production based on use of lime, acid phosphate as a supplement to manure, better handling of manure, and use of more legumes.—*E. H. Loveland, Chittenden, Vt.*

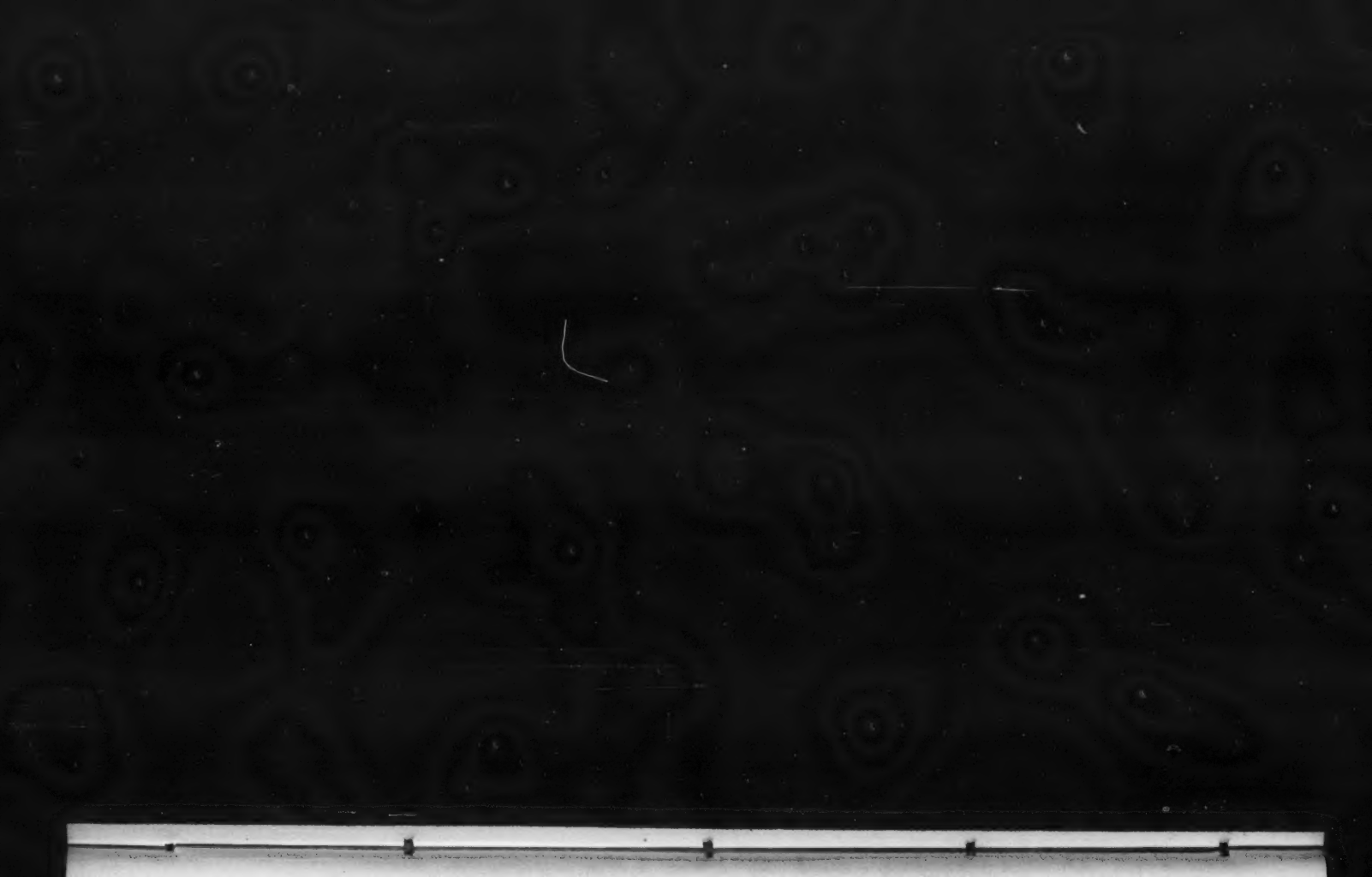
Organize a pure bred Holstein Calf Club of 60 members. Have a good County Fair—Use certified seed—Grade our truck crop better. Establish canning factory—Develop a better Dairy Association—Advertise milk as a drink.—*W. L. Kirby, Henrico, Va.*

Organize a group of farmers in a "Potato Ring" such as was carried out by the farmers of Summers County. Put across two potato demonstrations on the farms of W. C. Warner, Beckwitts and R. E. Smith, Wristen. Put about 29 boys' and girls' clubs with an enrollment of 490 through this summer with an 80% record.—*T. H. Howes, Fayette, W. Va.*

1. Get the farmers in each community into the habit of holding regular meetings to make a careful study of the most important problems pertaining to their business of farming. 2. Help organize local cooperation association. 3. Get the local associations into central cooperative marketing associations. —*J. F. Larson, Secy., Fond Du Lac, Wis.*

County Agent work here is new —began Dec. 1, 1923, community organization is our big problem this year. The securing of good seed corn is keeping us busy right now. A recent survey of the county indicates that corn, hogs, dairy cows, and poultry are of most interest to our farmers. 250,000 acres of land to be cleared of Prairie Dogs this summer. 75,000 heads of cattle to be dipped for Scabies.—*J. R. Neale, Campbell, Wyo.*

Increase bean, clover seed and corn production 100%. Ship 20 cars of dressed turkeys. This section produces the finest quality of turkey in America, and last fall we received the highest price paid at loading point for dressed birds—in car lots. —*L. E. McDaniels, Big Horn County, Wyoming.*



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Virginia-Carolina Chemical Co.
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Cordele—
Read Phosphate Co.
Macon—
F. S. Royster Guano Co.
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Pelham Phosphate Co.
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G. Ober & Sons Co.
Mutual Fertilizer Co.
Read Phosphate Co.
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Southern Fertilizer Co.
Swift & Company
Virginia-Carolina Chemical Co.
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Vidalia Chemical Co.

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Swift & Company
National Stock Yards,
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Swift & Company

INDIANA

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Swift & Company

Indianapolis—
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New Albany—
Calumet Fertilizer Co.
Read Phosphate Co.

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Swift & Company
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Swift & Company
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International Agricultural Corp.
Presque Isle—
Armour Fertilizer Works

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Armour Fertilizer Works
Baugh & Sons Co.
Griffith & Boyd Co.
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American Agricultural Chem. Co.

MICHIGAN

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American Agricultural Chem. Co.

MISSISSIPPI

Jackson—
Virginia-Carolina Chemical Co.
Meridian—
Meridian Fertilizer Factory
Tupelo—
Tupelo Fertilizer Factory

MISSOURI

St. Louis—
American Agricultural Chem. Co.
Armour Fertilizer Works
Swift & Company

NEW JERSEY

Bound Brook—
Nitrate Agencies Co.

NEW YORK

Buffalo—
American Agricultural Chem. Co.
International Agricultural Corp.
New York—
American Agricultural Chem. Co.
Armour Fert. Wks. (East.Hdqrs.)
International Agricultural Corp.
Mutual Fertilizer Co.
National Aniline & Chemical Co.
Nitrate Agencies Co.
Virginia-Carolina Chemical Co.
Zaldo & Martines Exchange Co.

NORTH CAROLINA

Charlotte—
International Agricultural Corp.
F. S. Royster Guano Co.
Swift & Company
Durham—
Virginia-Carolina Chemical Co.
Greensboro—
American Agricultural Chem. Co.
Armour Fertilizer Works
Swift & Company
Henderson—
American Agricultural Chem. Co.
Lillington—
Farmers Cotton Oil Co.
Harnett Oil & Fertilizer Co.
New Bern—
G. Ober & Sons Co.
Raleigh—
F. S. Royster Guano Co.
Tarboro—
F. S. Royster Guano Co.
Washington—
Pamlico Chemical Co.
Wilmington—
Acme Manufacturing Co.
Nitrate Agencies Co.
Swift & Company
Virginia-Carolina Chemical Co.
Wilson—
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Chester—
Swift & Company

Columbia—
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Armour Fertilizer Works
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North—
J. E. Culler Co.

Spartanburg—
American Agricultural Chem. Co.

TENNESSEE

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Virginia-Carolina Chemical Co.

Nashville—
Armour Fertilizer Works
Read Phosphate Co.
Virginia-Carolina Chemical Co.

VIRGINIA

Alexandria—
American Agricultural Chem. Co.

Danville—
G. Ober & Sons Co.

Lynchburg—
Pocahontas Guano Co.

Norfolk—
American Agricultural Chem. Co.
Baugh & Sons Co.
Farmers Guano Co.
International Agricultural Corp.
Priddy & Co.
Robertson Chemical Co.
F. S. Royster Guano Co.
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By Ted Butlar

BETTER CROPS' Washington Correspondent

After considering the agricultural export measure for several weeks and listening to the testimony of hundreds of witnesses telling them why the bill should or should not be endorsed, the House agricultural committee reported it out on April 24 by a vote of 14 to 6. By the time BETTER CROPS makes its May visit to you plans will have been completed to discuss the export plan on the floor of both branches of Congress with indications of an early vote. The bill was favorably reported sometime ago by the Senate committee but debate on the floor of the Senate was delayed until the House committee had issued its findings.

Although the Senate committee reported the export measure "as is," it was delayed by the House committee during a revamping process in which it was changed in certain particulars to meet some of the opposition. Briefly stated this bill is designed to set up an export corporation capitalized at $200,000,000, with full powers to go on the home market when a price emergency exists in any particular crop and to buy up what amounts to the exportable surplus until the price is on a par with the price of things the farmer must buy. This surplus would be sold on the world markets for the best price obtainable with the feeling that the domestic price would rise under tariff protection As originally drawn the bill provided that the expected loss on sales abroad would be charged back to the producer by issuing "scrip" to cover a protion of the purchase price. On March 17 the House agricultural committee passed an amendment eliminating the "scrip" provision giving power to the Corporation to estimate in advance the probable losses on export sales and assess the farmers a sufficient amount to cover them.

It is impossible to even hazard a guess at this time as to whether or not the export bill will ever be enacted into law. Its prospects in the Senate appear to be reasonably bright but initial action will be taken by the House. Strong opposition to the bill in the lower branch of Congress is such that its passage is problematical. One thing is certain, though. The export bill will be the only major measure to be considered by Congress at its present session out of the several which have been introduced and placed on file.

A great deal of attention in the form of several bills to promote and encourage cooperative marketing by farmers, is being evidenced by Congress. A recent bill along this line was recently introduced by a Kansas Senator. It would create an interstate farm marketing association with a revolving fund of $100,000,000. General objects of the corporation, as stated in the bill, are to promote an orderly flow of farm products in commerce; to remove direct burdens and undue restrictions on such commerce; and to provide for processing, preparation for market, handling, pooling, storing, and marketing of agricultural com-

modities through cooperative associations. Authority is given the corporation to consolidate the marketing operations of the affiliated state associations.

Definite action on the many bills reposing in committee files is becoming evident. A resolution directing the Interstate Commerce Commission to reduce freight rates on agricultural products has received a favorable report at the hands of the Senate committee on interstate commerce. A bill to establish a separate dairy bureau in the U. S. Department of Agriculture has been passed by the House and now awaits consideration by the Senate. One of the first bills to receive a favorable report from the House agricultural committee is one that would expand and strengthen the foreign work of the Department of Agriculture.

Authority would be given the Secretary of Agriculture to establish standards and requirements of seeds in a bill introduced by a Kansas Senator. It provides for the registration of specific lots of seed which come up to requirements although registration is not compulsory. Heavy penalties would be meted out to any person attempting to sell registered seed which had not been so designated.

A resolution offered by a North Dakota Representative provides for the creation of a joint commission of three Senators and five Representatives to investigate the subject of general crop insurance with a view of determining the advisability of creating a Crop Insurance Bureau or other agency.

A Georgia Senator is the author of a bill asking the Postmaster General to operate no more than fifty rural routes for one year in the transportation of food products directly from producers to consumers or vendors. Another postal bill of interest to farmers would make the rate on farm products one half the regular rate. Rural carriers would be allowed a commission on such packages in addition to their salary.

Sometime before adjournment Congress must dispose of a host of proposed amendments to the Federal Loan Act. One of these would abolish the tax exemption privileges now possessed by joint stock land banks operating under the act. Another bill would prevent the organization of new joint stock land banks and those now in operation would be prohibited from increasing their capital stock. Still another would amend the Federal act so that farmers could borrow money to repay indebtedness incurred for other than agricultural purposes.

Expenses of the Farm Loan Board and its employees would be paid by the Federal land banks and the joint stock land banks rather than by the U. S. Treasury as the act stands today, if a bill introduced in the Senate ever becomes a law. Under another recently introduced bill the Federal Farm Loan Act and the Agricultural Credits Act of 1923 would be amended to place the Federal Farm Loan Board, the supervising agency, under the Secretary of the Treasury. Salaries of members of the board would be reduced from $10,000 to $8,500 and that sum would be made the maximum for salaries in the future.

Complexion of the War Finance Corporation would be changed in certain particulars if proposed legislation is enacted. An amendment has been offered to give borrowers from the War Finance Corporation another year in which to repay loans. The limit would be extended from three to four years. Already during the present session a bill has been passed which extends the life of the War Finance Corporation from February 29, 1924 to November 30, 1924.

High Yields Make Low Costs

(*From page 10*)

make profits practically impossible. Taking the corn crop as an illustration, from 66 to 80 per cent of the total cost of the crop is chargeable to man and horse labor, and land rental. If seed, machinery and sundries be added the total fixed charges will constitute from 85 to 95 per cent of the total, whether a high or low rate of yield is maintained. It is obvious that in case of a low rate of yield, the grower will have to contend with a high bushel cost, whereas, by adding perhaps 10 per cent of the total cost, say for extra fertilizer, the condition may be entirely changed, a sufficient increase in yield being produced to bring about a significant decrease in the cost per bushel.

THE results of five years' tests at Ohio State University, show that a 40-bushel crop of corn gave only a 2.2 bushel or 5½ per cent profit. A 65-bushel crop gave an 18-bushel or 27¾ per cent profit. Records of the Ohio 10-acre corn contest in which growers are required to raise 100 or more bushels of corn on each of 10-acres, show, according to the college specialists, that the growing of 100-bushels per acre is excellent business. "High yields cut down overhead and reduce cost per bushel," they declare. W. H. Gilmore, who broke all known records last summer by averaging 134 bushels to the acre on 10-acres proved it. He cleared nearly 50c a bushel.

Mr Gilmore, by the way, has averaged over 100-bushels per acre for three years, and his record-breaking production came only as the result of special effort. He plowed under a clover sod, part of which had been heavily manured, and applied 18 per cent acid phosphate at the rate of 500 pounds per acre. The five-acres without manure each had 500 pounds of an 0-10-10 fertilizer. Generous feeding played an important part in the tremendous yield.

The Ohio Extension Service open the books of 28 Scioto County farmers for five years, to show that "yields-to-the-acre and the quantity

Which Will Pay the Best?

These photographs, taken at the Russellville, Kentucky, Experiment Field, show two different rates of corn production,—at the left 32 bushels per acre; at the right, 41.2 bushels per acre. The difference was produced at small cost by the application of manure limestone, potash and acid phosphate.

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The use of fertilizer has become a necessity to modern agriculture. Farmers of the Eastern States have realized for years the profit to be made from the use of fertilizers, and now the Western farmer is rapidly learning to look upon fertilizer as an "investment" rather than an "expense."

The American farmer is learning that by taking everything from his soil and returning nothing, he is headed straight for agricultural bankruptcy, and that every dollar spent on good fertilization is better invested than a dollar in the savings bank.

But fertilizer, to be most efficient, must be mixed with brains. It must be properly applied.

For many fields and many crops, a broadcast distributor offers the best solution of the problem of how to make the application.

There is no distributor on the market that can equal the New Peoria. It took years of actual experimenting in the field to finally produce this high-grade distributor. It bears little resemblance to the makeshift box-wheels-and-axle contrivances commonly found on the market.

We also manufacture Fertilizer Drills in all sizes.

For Catalog and Prices Address

Peoria Drill and Feeder Co.

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Increasing Profits on an Iowa Rotation

Middle West farmers are learning that it pays to spend money to increase their rates of yields. These two photographs taken at the Calamus, Iowa, Experiment Field show why. A simple, inexpensive fertilizer treatment which has produced 15 bushels more corn per acre, 12 bushels more oats, and one ton more hay, caused the marked difference in these two plots of corn.

and kind of live stock kept had more to do with profit and loss than any other factors."

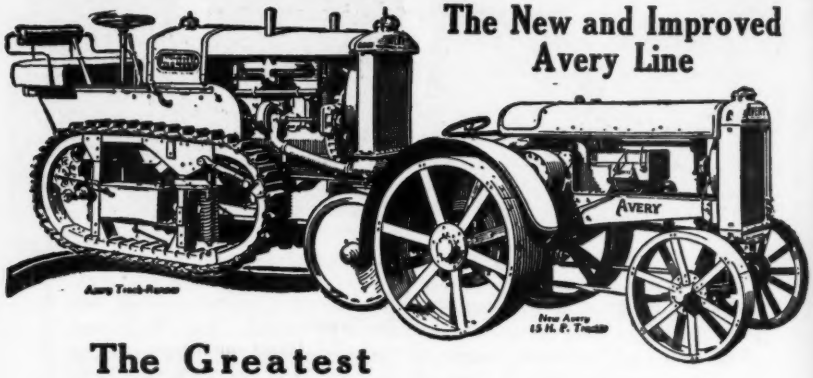
The five best paying farms averaged for the five years period, five bushels of corn, three bushels of wheat, and 600 pounds of hay per acre more than the other 23 farms. Whatever was grown on the farm, it paid and paid well to feed properly and liberally.

> "Not greater total production but greater production to the acre, or the cow, or the hen, was what made profits. It cost about as much to feed a poor cow, or hen, or to work a poor acre, and the per unit cost of the product in this case often ran so high as to exclude profit at present prices."

Next month you will have the conclusion of this interesting article in which Mr. Brewer shows the relation of yields to costs for wheat, potatoes, tobacco and other crops.

Special Soil Types Require Special Treatments

This corn was grown on muck land in DeKalb County, Illinois. A special treatment—the application of potash, and acid phosphate—met the requirements and produced a much more profitable yield.



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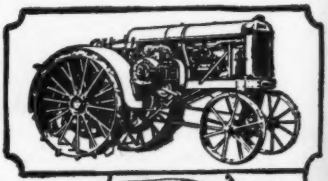
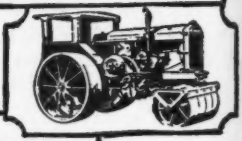
Never in tractor history have so many new improvements and desirable features been developed in one line. Avery machines now give better and more economical service and sell at lower prices.

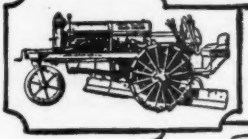
The Avery Line for 1923 includes the Improved Avery Track-Runner that runs on a roller-bearing track; the NEW Avery 15 H. P. enclosed gear, 3-plow wheel tractor, with two bearing belt transmission and two gear contact drawbar transmission; the Improved "Road-Razer" for shaving unpaved roads and streets smooth in summer and removing snow in winter; the Improved Avery Tractors for farming, threshing and road-building in the 20-35, 25-50 and 45-65 H. P. sizes; also grain-saving threshers in all sizes, motor cultivators, tractor plows, tillage tools and other drawbar and belt machinery.

Get the latest prices on Avery Tractors which now give you more horse-power per dollar than ever before offered.

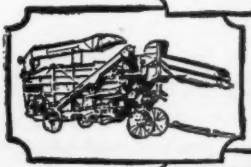
"It pays to Avery-ize"


Improved Avery 20-35 H. P. Tractor. Also built in 25-50 and 45-65 H. P. sizes


Improved Avery 25-50 H. P. 10-Ton Road-Roller-Tractor. Also built in 45-65 H. P. size


Avery "Road-Razer"

Avery Motor Truck


Avery Grain-Saver Thresher. Built in "Yab Iow-Baby," "Yellow-Kid" and "Yellow-Fellow" sizes.

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Branch Houses, Distributors and Service Stations covering every State in the Union.

AVERY

Tractors, Trucks, Motor Cultivators Threshers, Plows, etc.

The Experiment Stations

(*From page 16*)

prestige of the latter a bit if he explains the source of his strength, that it is not his job to work out scientific problems, and that if he is to continue to be helpful to the community as an advisor and expounder of new things it will be by reason of what investigation develops and makes available for practical use.

Agriculture is a continual contest or warfare between the forces for good and the powers of evil. Someone inquired in a recent hearing on appropriations whether the necessity of experimenting and investigating wouldn't come to an end. Clearly it will not so long as population and congestion grow and the demands upon the soil increase. Even with the efficient county agent system to help spread the practice of better farming and attain the highest efficiency for every farm, the growing needs of the population for food could not be met indefinitely, probably not very long. It is only necessary to think back some thirty years to realize how little was known about dairying, for example, and how the knowledge gained since then makes that industry so highly efficient as a source of food at present. It is doubtful whether, without such changes as have come through investigation, the present need for dairy products could be met, certainly not without danger to health and a far lower grade of quality.

Science has been the great basis of progress in civilization. There is no more striking example of this fact than in agriculture. During the life of the agricultural colleges there has been more progress in matters relating to farming than in all the centuries that went before. It is still possible to compare it in its advanced state with its exceedingly primitive form in countries where scientific investigation has not penetrated. The crooked stick and the crude mattock are not yet obsolete in those countries.

Together the experiment station workers and the extension workers make a wonderfully strong combination. The effectiveness of this combination in a given case depends, of course, upon the attitude of the two agencies towards each other, the confidence they feel in one another and the spirit of wholehearted cooperation. A feeling of self-sufficiency, or lack of sympathetic interest on the part of either group will go a long way towards destroying the benefits which should flow from their relationship.

THAT these things are realized by the experiment stations hardly needs to be said. Everywhere they welcome the cooperation of the forces in the field, the suggestions which come out of their daily contact with practical affairs, the opportunity to bring their work into wide use through the agencies of extension. They are giving much attention to making their results readily available to that class of workers. This is not only done through publications, but when opportunity offers they recognize the advantage of presenting special features of the station work to the extension forces, so as to give them first-hand information on what is being done and the object and meaning of it.

This is important for the extension worker, for he can never afford to stop growing and he will recognize the means to that end. As an educated man trained to think and to reason his interest can not cease with the bald fact or the empirical rule. He will cultivate an inquiring mind which will ask why and how, looking confidently to the time when these can be explained.

WE solicit your inquiries when in the market for Potash Salts in any quantity or for fertilizer material of every description, direct or through our nearest branch office; these are maintained for your service.

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Importers and dealers in Sulphate Ammonia, Blood, Tankage Phosphate and all fertilizer materials

"Let Us Spray"

(*From page 13*)

A first class 300-gallon spray outfit like this will control apple pests in an average 50 acre orchard.

them out with special reference to his particular orchard.

Keeping in mind that the average grower in the Cumberland Valley and particularly the Valley of Virginia, puts into barrels approximately 60 per cent of his total tree crop let us see what results can be obtained under a proper system of spray management. The following data are the result of investigations conducted by the writer at Winchester, Va., in the heart of the section mentioned above.

Table No. 1.—Showing the percentages of pest injury in plats of Winesap on which the full program of sprays was applied compared to plats in which no sprays were applied. Winchester, Va. 1922.*

Disease or Insect Pest	Full Program	Unsprayed Trees
Scab	7.5%	97.2%
Black Rot	.52	5.1
Cloud	none	9.6
Codling Moth	.22	6.1
Curculio	1.2	2.3
Aphis	.66	31.1
Scale	.27	2.0
Leaf Roller	.22	8.0
Percentage of Blemish-Free Fruit	87.5%	1.3%

*Winesap is the scabbiest variety in Virginia.

In the case of Stayman the percentage of blemish-free fruit in the properly sprayed plats was 90 per cent compared to 3 per cent in the unsprayed plats. In the Rome Beauty orchard the properly sprayed plats produced 85 per cent of blemish-free fruit compared to one per cent in the unsprayed plats. The number of sprays applied in this case was seven, as follows:

Outline No. 1.— Showing spray program recommended for the Valley of Virginia. It produces 80 to 90% of barreled apples.

(1) *Delayed Dormant:* applied when buds are showing silvery tips. Lime sulfur one to eight strength and ¾ pint of nicotene sulfate per 100 gallons of spray mixture.

(2) *Pink Spray:* applied when buds begin to show pink. Lime sulfur, five quarts of standard strength concentrate to 50 gallons of water.

(3) *Calyx Spray:* applied when 415 of petals have fallen from the blossoms. Same materials as in No. 2 except the addition of 1½ pounds powdered lead arsenate for each 50 gallons of spray material.

(4) *Two-weeks Spray:* applied approximately 10-14 days after Calyx spray. Same materials as in Spray No. 2.

(5) *Five-weeks Spray:* applied approximately five weeks after the Calyx spray. Use 3-5-50 Bordeaux Mixture. Add 1½ pounds powdered lead arsenate for every 50 gallons of mixture.

(6) *Ten-weeks Spray:* applied approximately 10 weeks after the Calyx spray. Use same materials as in Spray No. five.

(7) *August Spray:* applied after second week in August. Use six pounds powdered lead arsenate for each 100 gallons of water. Add 20 pounds of lime to each 100 gallons of the mixture.

The average grower does not apply more than four or five sprays and as a result he produces only 60 per cent of barreled apples. The inspection of fruit in the work mentioned above was far more critical than in ordinary orchard practice and the percentages of barreled fruit would be slightly higher than the percentages of blemish-free fruit. The fact brought out is, that it is possible to produce a much higher percentage of barreled apples than the average grower is producing today. With sufficient spraying equipment to enable him to do timely and proper spraying, every apple grower in the Cumberland Valley section should put into barrels not less than 80 per cent of his total tree crop.

The cider vinegar factories at Winchester, Va. and Martinsburg, W. Va., ground up approximately 75 million pounds of cull apples in the fall of 1923. We have analyzed the causes that send apples to the cull pile by inspecting thousands of apples. Our analysis shows that approximately 65 per cent of all causes of culls are preventable by proper spraying. We venture to say that this situation is typical of many other fruit sections in the United States.

This is the little messages we have asked "Jeff" to broadcast to his readers. Like the words of the marriage vows—they are few but they go a long ways. We have tried to say that the average apple grower, everywhere, does not do enough of timely and proper spraying. If, as we have proven, he can increase his percentage of barreled apples from the present average of 60 per cent to the higher average of 80 per cent or more, his slogan at the beginning of the 1924 spray season should be—"Let us Spray."

The very fine mist drifting through the trees is an essential feature of good spraying.

How My Wife Helps

(*From page 7*)

soy bean seed or what the lime-stone will cost for his alfalfa field or just how the innoculating material is applied to some legume seed. Then there is the use of spray materials and insecticides. She usually has some of the principal formulas at the end of her tongue ready to be given out.

We have never had a home demonstration agent in the two counties where I have spent my time as County Agent and yet there has been a good deal of work done with groups of women in the county by using specialists from the College of Agriculture and Home Economics. My wife has attended a great number of these meetings of all kinds and consequently has learned to be what would be called a "local leader" or local demonstrator. Of course, she does not have much time to go out and really put on demonstrations because we are raising two children of our own and she considers her home as always first and most important, yet there have been many times in the past ten years when she has been of some real help to a group of women interested in something like a dress form demonstration or a cold pack canning demonstration or something of that nature. Very often the women call her up from all over the county and ask her for the principal directions in regard to cold pack canning of vegetables or corn or something of that nature. Of course she is able to give better information along this line than is the male member of the household as her information is based largely upon experience.

TWICE in my experience as County Agent it has fallen to my lot to undertake to prepare an exhibit of everything grown in the county and take this to our State Fair. I am very sure if it had not been for the wife who stood by me in these strenuous times of getting this material together and putting it up at the State Fair grounds, the work would have been very poorly finished indeed. I will never forget the first exhibit that we took to the Fair several years ago. We had hired a truck to haul the material and when it was dumped out a conglomerate mess at the State Fair grounds, we had very little idea in regard to just how we were going to put this up and arrange it. We did the best we could to straighten out this material and worked until nine o'clock that evening. Then we decided the only thing we could do was to go to bed, and get up early and make a fresh start in the morning. We went to our room but not to sleep very long for we got up at three o'clock and both together worked out the entire scheme for arranging this display. It proved to be so good that we won enough premium money to practically pay all expenses. After we got safely home from this undertaking we swore that we were never going to get ourselves into a thing like that again. But last summer our committee in the county where I am located decided that we must have an exhibit at the State Fair, so, as we had forgotten the worries of the past undertaking, we jumped into it again, and when I told my wife I would need her at Sedalia she demurred at first but seeing such a blank forsaken look coming over my face she relented and changed her mind and gave just as loyal help as it was possible for any person to do, putting in three full days in the Fair grounds.

Now I never thought I was a very good mixer when it comes to getting around among strangers and I have always considered my wife had me beaten on this score. I would

Did you ever figure what it costs you NOT to use fertilizer ?

¶ The only complete fertilizer plant in the state. It is open for your inspection at all times. We shall welcome the opportunity to show you where

"WHITE DIAMOND" FERTILIZERS

are made, and why they are better.

ARKANSAS FERTILIZER COMPANY

Little Rock, Arkansas

Send for booklet—*"How Arkansas Farmers Have Increased Their Bank Accounts"*

certainly say that she is a great help in various kinds of country community meeting, farm picnics, basket dinners, tours, etc. I have known a few County Agents who would not want their wives to go with them to meetings of this kind. I do not know whether they were ashamed of their wives or whether they thought they were so bright and charming they would outshine their husbands but, be that as it may, I am very sure it has always helped my work to have my wife attend meetings of this kind and mingle with the folks and get their confidence and friendship.

Oh, yes, I would say there are thousands of ways that a County Agents' wife may help him to do better work and not only help *him* but she really does a good deal of the work herself although very often no credit is given her.

To all the unmarried county agents who might happen to read this, I can only suggest that you hasten to find the right kind of a woman who will be a real partner with you in this life work and who will bolster you up when you are blue, will offer kindly criticism when your work is not the best, who will call you down when you need it and hold back when you become too enthusiastic over some project and push you forward when you show timidity in undertaking a hard piece of work, always acting as a balance wheel to keep you from losing your head or getting out of the straight and narrow way.

"He Applied Business Methods to Farming — and was Successful." This is the title of an article in our June issue, in which Dean Stewart tells the absorbing story of how one farmer won out.

If you are trying to make farming more efficient and business-like, you will want to read this true story and show it to your friends.

The Agricultural Depression

(*From page 24*)

This does not mean that farmers have no way of making adjustment. They have a very drastic way, but an exceedingly slow one. That is, they dismiss the hired men; the sons go to the cities; and from regions where farming is ordinarily close to the margin the farmers themselves go to the cities and leave the farms idle. Differences between farm and city conditions have to be very great before men are willing to change their occupations, abandon their homes, and go elsewhere. Such an adjustment takes years, and when once made, it takes years to overcome it.

Many more children are raised on farms than are needed as farmers, hence nearly half of the farm children normally go to cities. The number on farms in 1920 was altogether too high for the world demand for farm products, so that a large movement to cities was necessary. When so large a movement occurs, it often goes too far.

The effect of the panic on agriculture as an industry is not so serious as the effect on individuals. When a man loses his savings as a result of deflation, the property passes to another individual, who may continue to use it reasonably well. The disrepute into which the industry falls is serious and checks development and improvement. For example, the Advanced Registry Testing of dairy cows has been looked upon as the most important means of finding the best animals and developing better cattle. The amount of such testing in 1923 was about half as much as formerly. Breeders of purebred cattle, hogs and horses have suffered severely. The laying of tile drains and the liming of soils had been rapidly increasing. This increase was checked. The period from 1900 to 1914 was one of exceedingly rapid introduction of scientific methods in agriculture, and it was a period in which thousands of very able young men prepared for farming by taking thoro courses of study. This development has been checked and agriculture will suffer accordingly. The results are serious, but are distributed over a long series of years and are not noticeable at once. The immediate result is a great decrease in the number of agricultural workers, but there is so much increase in the output per worker that production is checked very slowly. The striking immediate effect is on individuals. Thousands of thrifty persons lost their life-time savings through no fault of their own, and other thousands acquired ownership of the property. A great redistribution of wealth is taking place. In a considerable measure it is a movement of wealth, as well as of men, to cities.

The major method of adjustment in agriculture is by the falling off in the number of young men entering the industry. These men are not much missed at first because the persons remaining work harder. After becoming established in cities, they are not likely to return to farms. Conversely, a shortage of farmers is largely made up by keeping a greater percentage of the farm boys on the farms. In each case the process is slow. There seems to be a tendency to a 25-year cycle in agriculture. If agricultural depression continues for many more years —as it is certain to do if deflation continues—it is to be expected that when the tide turns it will be followed by a long period in which the high cost of living will be the burning issue. This will be due in part to too small an effort in agriculture, and in part to the adjustment of the city standard of living to abnormally cheap food supply which will have continued long enough to be looked upon as normal

Special Fertilizers

to meet special soil conditions are a step in advance in the

Fertilizer Industry

¶ "Sunrise Brand" Fertilizers are used by the most exacting trade with the knowledge that only the best materials go into the manufacture of our fertilizer.

LONG ISLAND PRODUCE & FERTILIZER COMPANY

RIVERHEAD, N. Y.

Manufacturers of

"Sunrise Brand" Fertilizers

The writer's guess is that the tendency of the general price level will be downward for some years, and that the pre-war level will be approximately reached in about a decade. If this is correct, agricultural depression will continue until prices rise, or until they have been stable for a number of years, so that capital investments are on a basis no higher than the price level at which the produce is sold. This does not mean that every year will be unfavorable. Some farm products even now are in a very good position. It means that the bad years will be more numerous than the good ones.

If the general price level turns upward and remains high, agricultural prices will be adjusted, and the depression will be over in a few years. For real prosperity on farms three things are necessary:

1. A price level as high as the general range of prices at which the bulk of the indebtedness was incurred.
2. Adjustment between farm prices and prices of other commodities.
3. Reasonable stability of the general price level. (A moderate increase in prices such as occurred from 1897 to 1914 stimulates agricultural development.)

Watch for the June Better Crops! It will contain maps showing where fertilizer experiments are being conducted in North Carolina and South Carolina. These are the first two of a series of such maps covering the Southern States, prepared by David A. Long of the Soil Improvement Committee of the Southern Fertilizer Association. You will want to save them!

Giving Advice

(*From page 6*)

Let him *sell* his thoughts—not merely pass them fatherly out.

Advice is sometimes advanced, when only facts are requested. I ask you for data on seed corn and you are not satisfied to hand me the facts and bulletins, but you must throw in *your* opinion as to what to plant. You haven't even the good judgment to wait until I ask for your opinion—the advice flows out, gratis, thus proving to me that you are unwilling to trust my own judgment in the matter; and your smirk of satisfaction as you peddle out your pet policies, while leaning down from the high seat of your superior intelligence, fires me with anger. I see red—and the red is on the end of your nose!

Hundreds of thousands of men —lawyers, advertising specialists, agronomists, chemists, electrical engineers, consulting engineers, dye experts and others—make their livelihood through giving advice. It's a business. And usually these men are solid, substantial citizens who are looked up to and respected in their communities—to whom, for their wisdom and experience, their clients doff their mental hats.

And you can take it from me, Lester, that when a man—a professional advisor—complains of the stupidity of his advisees, and frets at the antagonism that evidences itself toward him on every hand, there is either something radically wrong with that man personally, his advice is festered with maggots, he lacks experience, he hasn't mastered the science of selling himself and his ideas—or he is merely deficient in the simple art of getting along with folks.

Advice, then, should be given only by a competent specialist, upon his own specialty, when called upon — preferably for pay — any other kind of advice, given in any other way is ruinous to the dispositions of advisors and advisee.

About Ourselves

BETTER CROPS is a monthly magazine edited primarily for all those who act in an advisory capacity to the farmer.

PUBLISHED by the Better Crops Publishing Corporation, 81 Fulton St., N. Y. C.

SUBSCRIPTION PRICE — $1 per year. Single copies 10c each.

CHANGE IN ADDRESS — Readers should always give old as well as new address and allow at least three weeks for the change.

MANUSCRIPTS should be brief and preferably typewritten. They will be returned only when proper postage is enclosed.

THE PUBLICATION of an article over an author's name, pen name or initials does not necessarily imply that we endorse the opinions expressed therein. We print articles for their interest and merit regardless of whether they accord with our own opinions.

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ADVERTISING — BETTER CROPS accepts only such advertisements as it has investigated and believes to be thoroughly honest. Readers are requested to say "I saw your ad in BETTER CROPS" when ordering.

MERCHANDISING SERVICE—We are glad to supply all the information that we can secure regarding agricultural supplies or equipment to any reader who will address the Editor stating his problems and furnishing necessary details. Your name will not be disclosed unless you desire it. There is no charge for this service.

BETTER CROPS PUBLISHING CORP.

81 Fulton Street New York

Exposed At Last!

Dear Jeff:—

For the love of mike, Jeff, why didn't you let us know you were in New York an editor of an agricultural publication? You have caused me no end of trouble, and Bud and I have been looking thru' all the Sunday papers for you. We sent your name to the lost and found department of several local papers and sent your picture (the one taken with me at Atlantic City) to the leading detective agencies with a large reward for information about you. We would be looking yet, if your friend, my wife, hadn't found out where you were thru' a friend of hers who knows a county agent.

You always were independent and running away like this, but you are not going to forget me, are you Jeff? You won't forget all those nice things I have done for you, the swell feeds you have had at my house, and the times I've carried you home after a night out with the boys? Remember the time I slipped you two aces during that little game?

I've always stood by you, Jeff, shielding you from public criticism and pushing you to the front, even sacrificing myself that you might be famous. Didn't I lend you money when you were broke, and send you flowers after my wife put you in the hospital? Now you leave me without a word and go to New York.

The last time I saw you, I was in front of a brick and you were behind it, but I haven't much recollection of what happened after that. You must have left immediately. Let's get together again Jeff, and square accounts. I'm still your pal and you need me. Use discretion.

As ever,

MUTT.

A Modern "Agriculturist"

By Will Gallup

'Tware jest th' other day, I vum, I met old Sy Van Buss.
A right smart He dirt farmer, an' a calculatin' cuss.
Nobody's goin' ter git ahead of Simon, no siree,
Unless they's edjucated more 'n most folks uster be.

Old Sy has bin here, wal lets see, I cum in '94
An' he'd bin a farmin' here fer most five years before.
His place was not so turrible, most th' barns war in good shape
An' the house was built so long ago, folks called it "up-to-date."

But Sy was never satisfied, Lord knows he wud abin,
If he'd stopped ter count his money 'stead of always figurin'
How ter farm more scientific, some say as how that's bosh,
But th' critters Sy had on his place war *registered,* by gosh.

He'd read them publications sent out by Uncle Sam—
New fangled ways of milkin' er how ter shear a ram.
Then Sy wud set there thinkin'—mebbe mumble to the air,
If I cud live a hundred years, I'd be a millionaire."

Wal, I jest saw him yesterday as I driv by his place,
An' I guess Sy's wish 'as bin granted, from th' strange look on his face.
I didn't stop ter question him (I wisht that I'd awaited)
High-falutin' ways is gettin' Sy. He's bin *REJUVENATED.*

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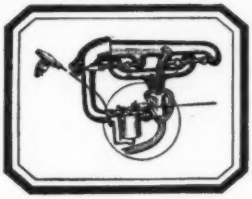

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